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Sandia National Laboratories

ENVIRONMENT, Safety & HEALTH Manual

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[PN471011](#) - *SNL/NM Emergency Plan*

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[GN470011](#) - *Separating Eating and Drinking From Toxic Materials*, Archived - Last issue date: February 1, 1991

[GN470016](#) - *Use of Powered Carts*, Archived - November 30, 1995

[GN470035](#) - *Sandia Workplace Hazards Awareness System (SWHAS)*, Archived, December 16, 1998

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[MN471007](#) - *SNL Hoisting & Rigging Manual*, Archived, August 31, 1999

[MN471010](#) - *ES&H Training Catalog*, Archived, July 28, 1999

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[MN471018](#) - *Conduct of Operations Manual: Explosives Operations*, Archived, September 19, 2006

[MN471019](#) - *SNL/CA Office ES&H Manual*, Archived, March 1, 1999



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ENVIRONMENT, Safety & HEALTH

Manual

Glossary

Subject Matter Expert: [Bob Goetsch](#)

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A

Abrasive or destructive methods – Include, but are not limited to, grinding, buffing, sanding, polishing, machining, abrasive blasting or sawing, melting or casting, welding, brazing, torch cutting, or heat treating, destructive testing.

Aboveground oil-storage tank (AST) – A single tank or combination of tanks, including piping that is permanently installed; contains petroleum, including crude oil; and holds more than ninety percent of its volume above the surface of the ground. Tanks in vaults and special enclosures are ASTs.

AC – Alternating current

Accelerator – A device employing electrostatic or electromagnetic fields to impart kinetic energy to molecular, atomic or sub-atomic particles and capable of creating a [radiological area](#). The following devices are excluded:

- Unmodified commercially available units that are acceptable for industrial applications, including (but not limited to) electron microscopes, ion implant devices, and x-ray generators.
- Non-medical x-ray devices with the capability of accelerating particles to energies not greater than 10 MeV, which are operated in accordance with American National Standards Institute (ANSI) N43.3-1993, *General Radiation Safety-Installations Using Non-*

Medical X-Ray and Sealed Gamma-Ray Sources, Energies Up to 10 MeV, or in accordance with another applicable consensus standard as directed by the cognizant Field Element manager. [At Sandia, operation conducted under the Radiological Protection Procedures Manual, chapter 10 meet this requirement.]



- Low-voltage neutron generators incapable of creating a [radiological area](#) and which are operated in accordance with National Council on Radiation Protection (NCRP) Report 72-1983, *Radiation Protection and Measurements for Low-Voltage Neutron Generators*, or in accordance with another applicable consensus standard as directed by the cognizant Field Element manager. For the purpose of this Order, a low-voltage neutron generator is defined as a bench-top scale, single-purpose device generating neutrons by accelerating deuterons or tritons into targets through a maximum accelerating potential not greater than 600 kV.

Accelerator Readiness Review – A structured method for verifying that hardware, personnel, and procedures associated with commissioning or routine operation are ready to permit the activity to be undertaken safely.

Acceptable entry conditions, confined space – Conditions that shall exist in a confined space to allow personnel to enter confined spaces and to ensure personnel involved with a confined space entry can safely enter into and work within the confined space.

Acceptable entry reference level (AERL) – Establishes the allowable atmospheric concentration limits for entry into a [permit-required confined space \(PRCS\)](#). The allowable limits are written on the permit. An atmosphere containing airborne contaminants that are below those levels identified as a "hazardous atmosphere" may be considered acceptable for entry.

Acceptance limits – Specific values, conditions, or range of parameters within which a facility operator has proposed to operate the facility and which the DOE has accepted during its review of the facility [Authorization Basis](#).

Acceptable practice – A process or condition with no observed problems.

Accident – An unintended sequence of events that result in an undesired consequence.

Accident analysis – For purposes of properly implementing the USQ process, the term refers to those bounding analyses selected for inclusion in the SAR. These analyses refer to [design basis accidents](#) only.

Acclimatized – Adapted to a given temperature extreme.

Accountability – Liability (held answerable) for performance and/or outcomes.

Accumulation – Collection of characterized, compatible wastes in a designated accumulation point.

Action – A new or continuing project, program, or activity. Examples of SNL actions include, but are not limited to, the following:

- Research, development, and testing projects and programs
- Construction projects, including relocation and renovation projects
 - Laboratory testing
 - Outdoor testing

Action level – The Occupational Safety and Health Administration (OSHA) published chemical specific averaged 8-hour exposure level (concentration in air) which is typically one half the [Permissible Exposure Limit \(PEL\)](#).

Action level(beryllium) – Is the level of airborne concentration of beryllium (0.2 micrograms beryllium per cubic meter ($\mu\text{g Be}/\text{m}^3$), calculated as an 8-hour time weighted average exposure, as measured in the worker's breathing zone by personal monitoring) that if met or exceeded, requires the implementation of worker protection provisions.

Activity – Facilities, operations, processes, systems, or projects that are subject to an Operational Readiness Review (ORR) or Readiness Assessment (RA) prior to startup or restart.

AQCR – Air quality control regulations

Acute hazardous waste – An unused and possibly off-specification commercial chemical product, including container residues and spill residues (such as contaminated soils and water) having a generic name as listed in 40 CFR 261.33(e).

Acute toxicity – Those substances which are highly toxic or toxic as defined under 29 CFR 1910.1200 Appendix A, and may be fatal or cause damage to target organs as the result of a single exposure or exposures of short duration.

Administrative control [Lockout/tagout definition] – A piece of equipment or a system that must be locked or tagged for reasons unrelated to maintenance or service.

Administrative controls – The provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure safe operation of a facility. Specific values, conditions, or range of parameters within which a facility operator has proposed to operate the facility and DOE has accepted during its review of the facility

authorization basis.

AEHD – Albuquerque Environmental Health Department

AERL – Acceptable entry reference level.

Affected worker [Lockout/tagout definition] – A Member of the Workforce whose job requires the operation or use of a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Agent, biological – Includes infectious agents of humans, plants, and animals, as well as the toxins that may be produced by microbes and by genetic material potentially hazardous by itself or when introduced into a suitable vector. (From [Biosafety in Microbiological and Biomedical Laboratories \(BMBL\), 4th Edition, Appendix C](#)).

Agent, physical – Those physical stresses identified as physical agents by the American Conference of Governmental Industrial Hygienists (ACGIHs). Examples of physical agents include the following:

- Airborne supersonic and ultrasonic acoustic radiation
- Noise
- Cold and heat stress
- Radio frequency/microwave radiation
- Hand-arm (segmental) and whole-body vibration
- Lasers
- Light and near-infrared radiation
- Ultraviolet radiation
- Static magnetic, sub-radiofrequency, magnetic, and static electric fields

Agents which act on the blood or hematopoietic system – Agents which decrease hemoglobin function and deprive the body tissues of oxygen.

Agents which damage the lungs, eyes, or mucous membranes – Chemicals which irritate or damage pulmonary tissues.

Air discharge – Discharge dispersed into the air by an SNL/NM organization and onsite contractor who:

- Handle or have the potential to generate beryllium, radionuclides, asbestos emissions, or other hazardous pollutants.
- Detonate explosives or ignite rocket motors.
- Burn material in the open air, which emits aerosols, fumes, particulate matter, or smoke.
- Disturb more than $\frac{3}{4}$ acre of soil.
- Demolish more than 75,000 cubic feet of building space.
- Construct new buildings, structures, or facilities that, in the future, have the potential to generate air pollutants.
- Modify or relocate sources that emit air contaminants.

Air temperature – Ambient air temperature determined by dry bulb thermometry.

Airborne radioactivity area – Any area, accessible to individuals, where:

1. The concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed the derived air concentration (DAC) values listed in Appendix A ([Word file/ Acrobat file](#)) or Appendix C ([Word file/ Acrobat file](#)) of [MN471016](#), *Radiological Protection Procedures Manual*; or
2. An individual present in the area without respiratory protection could receive an intake exceeding 12 DAC-hours in a week.

Aircraft – A device that is used or intended to be used for flight in the air, including heavier-than-air and lighter-than-air aircraft, airplanes, gliders, helicopters, rigid and non-rigid airships, and balloons.

Aircraft modifications – The addition to or change in instrumentation or structural modifications to the airframe which may affect the airworthiness of an aircraft.

Aircraft operator – The aircraft operator is the owner of the aircraft.

Aircraft support – The use of aircraft in support of SNL projects, tests, or other operations.

Aircraft type – As used with respect to the certification, ratings, privileges, and limitations of airmen, means a specific make and basic model of aircraft, including modifications thereto that

do **not** change its handling or flight characteristics. Examples include DC-7, 1049, and F-27.

Airworthiness – The condition and configuration of an aircraft making it fit for operation in the air.

ALARA – As low as reasonably achievable

Alcohol – Any liquor, wine, beer, spirits, ethanol, or other preparations containing alcohol.

AMCO – Administrative Management Committee

ANSI – American National Standards Institute

ANSI/ANS - American National Standards Institute/American Nuclear Society.

Apparent cause – An apparent cause is associated with each causal factor and is the underlying reason that the causal factor occurred. The apparent cause is derived from the Causal Analysis Tree (see [DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*, Chapter 11, "Occurrence Reporting Model and Causal Analysis Tree") and not from the root cause analysis. Every apparent cause is represented by a causal analysis code in the format: ABC.

Appliance – Any device used for household or commercial purposes (e.g., air conditioner, refrigerator, chiller) that contains and uses any class I or class II ozone-depleting substance as a refrigerant.

Applicability assessment – The step preceding the USQ process that ensures items under consideration that do not need USQ processing are screened out before the process is initiated.

Appraisal – A documented activity performed according to written procedures and specified criteria to evaluate the compliance and conformance of an organization with programs, standards, and other requirements contained in orders, laws, and regulations, or other requirements invoked by SNL.

Appropriate Energized Electrical Work – Appropriate energized electrical work is that associated with equipment or circuits:

- That if de-energized will lead to an increase in risk to worker health and safety. Equipment or circuits of this type include:
 - Life support equipment.
 - Emergency alarm systems.



- Local exhaust ventilation equipment.
- Where its de-energizing is infeasible based on operational limitations or equipment design.

An example of an operational limitation is where the equipment is an integral part of a continuous process that would otherwise need to be completely shut down in order for de-energized work to occur on a single circuit or part of the equipment. This may apply to long-term or un-interruptible experiments.

An example of an infeasible design is performance of diagnostic measurements, and troubleshooting and testing tasks that can only be performed when the equipment or circuit is in the energized state. Once the electrical problem is determined through such measurement, troubleshooting and testing tasks, the equipment shall be de-energized prior to allowing a worker to complete corrective electrical work.

Note: All electrical work not one of the above examples is inappropriate and shall be performed in the de-energized state.

Approved equivalent replacement part – A change that involves replacing one component with another that is identical, meets all design specifications, or has been demonstrated and documented to be equivalent.

Approved vendor – Provider of a course, which is not offered at a Sandia site, but has an SNL course number and course information in the catalog.

Ar – Argon (gas phase)

Armorer – An individual who, by schooling, experience, and assignment, is trained to operate, maintain, and repair firearms used by protective force personnel.

Article – A manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of 1910.1200), and does not pose a [physical hazard](#) or health risk to [SNL personnel](#).

Asbestos – A broad mineralogical term that applies to a number of fibrous silicate material, several of which occur in nature. Asbestos usually consists of silicon with one or more metals, such as sodium, magnesium, calcium or iron. Uses for asbestos-containing material include,

but are not limited to, electrical and heat insulation, paint filler, reinforcing agents in rubber and plastics (e.g., tile mastic), and cement reinforcement.

Asbestos waste – Per 20 NMAC 9.1, regulated asbestos containing material (RACM) which contains more than 1 percent asbestos as determined using the method specified in 40 CFR 763.1, Appendix A, Subpart F, and includes:

- Friable asbestos material, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure;
- Category I nonfriable asbestos containing material (ACM) that has become friable including asbestos containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos;
- Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or
- Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations, which excludes Category I nonfriable ACM; but

Asbestos waste does not include nonfriable asbestos containing materials that, when dry, cannot be crumbled, pulverized, or reduced to a powder by hand pressure.

As described – Those words, phrases, models, assumptions, pictures, graphs, or figures that are in the [Safety Analysis Report \(SAR\)](#) to represent an item of interest.

ASME – American Society of Mechanical Engineers

Asphyxiating environment – An environment with 19.5 percent or less oxygen.

Asphyxiating gas – Any gas that can displace sufficient amounts of oxygen to result in asphyxiation. Examples include:

- Argon
- Carbon dioxide
- Helium
- Hydrogen
- Nitrogen

- Sulfur hexafluoride

Asphyxiation – Lack of oxygen, which can result in loss of consciousness or death.

Assembly area – Primary assembly areas are exterior refuges or safe areas that may include parking lots, open fields or streets, which are located away from the site of an emergency and provide sufficient space to accommodate evacuated personnel. The designated areas shall be at least 50 feet from the building and situated so as not to hamper emergency operations. A secondary assembly should be predetermined in the event that the routes to the primary assembly area are blocked or otherwise restricted.

Assessment – An evaluation or appraisal of a process, program, or activity to estimate its acceptability.

Assessment/Survey/Audit – An evaluation of the effectiveness of an activity/operation or a determination of the extent of compliance with required procedures and practices.

Assigned tenant – Customer that occupies the space as listed in the internal lease agreement (ILA) or as defined in the [Occupancy Space Analysis Database \(OSAD\)](#).

At or near the point of (waste) generation – Location of a [satellite accumulation point \(SAP\)](#), wherever possible, within or immediately adjacent to the work area where the waste is generated such as in the same room or high bay. Specific constraints, such as worker health and safety, nuclear criticality safety, or other requirements may require SAPs to be located away from the point of generation.

At or near the point of (waste) generation (California) – Hazardous waste must be accumulated at the initial Satellite Accumulation Point (SAP) at or near the area where the waste is generated. The process generating the waste and the SAP must be in the same or adjacent room or area. Certain generating activities may necessitate interim accumulation of waste away from the SAP, provided those wastes are placed in the SAP prior to the end of the generator's work shift.

Attendant – A trained individual stationed outside a confined space who monitors the authorized [entrants](#) inside the confined space by maintaining effective and continuous contact, and who is knowledgeable of established emergency procedures.

Attenuation – The reduction in intensity of noise.

Authority – The expressed or implied power to perform, act, or decide.

Authorization agreement (AA) – A documented agreement between DOE and the contractor

for high-hazard facilities (Category 1 and 2) incorporating the results of DOE's review of the contractor's proposed authorization basis for a defined scope of work. The AA contains key terms and conditions (controls and commitments) under which the contractor is authorized to perform the work. Any changes to these terms and conditions would require DOE approval.

Authorization authority – The minimum level of management approval required to grant authorization to proceed after a Readiness Review has been successfully completed.

Authorization basis – The documents produced by the Authorization Basis Process that management relies upon to assure that Sandia facilities, activities, and operations adequately control hazards within the bounds of regulatory requirements and acceptable risk. For nuclear facilities, the DOE required Documented Safety Analysis is encompassed by the authorization basis.

Nuclear safety authorization basis is further defined as the safety documentation that supports the decision to allow a process or facility to operate. Included are corporate operations and environmental requirements as found in regulations and specific permits, and, for specific activities, work packages or job safety analyses. The safety basis is considered a subset of the authorization basis.

Authorized Limit (release of waste) – A limit on the concentrations of residual radioactive material on the surfaces of or within property that has been derived consistent with the as low as reasonably achievable (ALARA) process, given the anticipated use of the property (either restricted or unrestricted), and that has been authorized by DOE to permit the release of the property from DOE control.

Authorized, qualified operator – SNL personnel who are trained and are able to demonstrate basic knowledge and skill at a level that ensures the safety of people and equipment. This knowledge and skill may be acquired through a formal education process and/or on-the-job training (OJT).

Authorized, qualified operator – Members of the Workforce who are trained and are able to demonstrate basic knowledge and skill at a level that ensures the safety of people and equipment. This knowledge and skill may be acquired through a formal education process and/or on-the-job training (OJT).

Authorized worker [Lockout/tagout definition] – A Member of the Workforce who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected worker becomes an authorized worker when that worker's duties include performing servicing or maintenance covered under this section.



Backward-looking USQ – A [USQD](#) performed on an existing, as-found condition, as a potentially inadequate safety analysis ([PISA](#)) finding. The USQD is performed using the rationale that asks the question, “Had we proposed such a change under our previous conditions, would it have involved a [USQ](#)?”

Band saw – A machine equipped with an endless steel band having a continuous series of notches or teeth, running over wheels or pulleys, and used for sawing materials.

Barricade – An obstruction to deter the passage of persons or vehicles.

Barrier (physical) – Any device or method that effectively prevents contact with a recognized hazard. Examples include railings, rope, fences, barricades, shields, enclosures, rubber mats, plastic and metallic guards, or elevation above eight feet (i.e., guarded by height).

Basis for a Technical Safety Requirement (TSR) – The operable equipment and specific facility conditions that are necessary to meet the assumptions in the facility safety analysis as described in the [Safety Analysis Report \(SAR\)](#) and DOE-issued Safety Evaluation Reports (SER).

Basis for interim operation – A document demonstrating that [SNL personnel](#) can conduct facility operations at an acceptable level of safety before development of more detailed safety documentation as required by [DOE 5480.22](#) and [DOE 5480.23](#) and before DOE approves that documentation.

bcc – Body-centered cubic crystal structure. Many bcc-structured metals that are ductile at room temperature become brittle at cryogenic temperatures.

Beryllium – Elemental beryllium and any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater that may be released as an airborne particulate.

Beryllium activity – An activity taken for, or by, DOE at a DOE facility that can expose workers to airborne beryllium, including but not limited to design, construction, operation, maintenance, or decommissioning, and which may involve one DOE facility or operation or a combination of facilities and operations.

Beryllium article – Is a manufactured item that is formed to a specific shape or design during manufacture, that has end-use functions that depend in whole or in part on its shape or design during end use, and that does not release beryllium or otherwise result in exposure to measurable airborne concentrations of beryllium under normal conditions.

Beryllium-associated worker – A current worker who is or was exposed or potentially exposed to airborne concentrations of beryllium at a DOE facility, including:



1. A beryllium worker.
2. A current worker whose work history shows that the worker may have been exposed to airborne concentrations of beryllium at a DOE facility.
3. A current worker who exhibits signs or symptoms of beryllium exposure.
4. A current worker who is receiving medical removal protection benefits.

Beryllium-containing and beryllium-contaminated waste – Is material to be disposed of meeting one of the following criteria based on process knowledge, calculation and analysis, and/or sampling; and where beryllium is not from a natural source:

- Equipment and other items with removable contamination (internal and/or external) exceeding 0.2 $\mu\text{g Be}/100 \text{ cm}^2$. Decontamination and fixed removable contamination through encapsulation or other methods may be used to meet this limit, that is, not exceeding 0.2 $\mu\text{g Be}/100 \text{ cm}^2$.
- Building materials and demolition debris containing beryllium exceeding 0.1 percent (W:W) (1000 parts per million).
- Job associated materials, such as but not limited to, gloves, booties, disposable coveralls coming from a regulated area; or from an operational area unless it can be demonstrated the material would not have become contaminated, such as through the use of isolation techniques or during a non-intrusive walkthrough of an building/area.

Beryllium-contaminated equipment and other items – Are equipment or other items:

- To be released from a beryllium regulated area; or
- Any equipment or other items for which it has been established through sampling that the removable contamination exceeds 0.2 $\mu\text{g Be}/100 \text{ cm}^2$; or
- It has been established the equipment or other items possess a potential risk of exposure to the recipient based on a beryllium risk assessment performed by an industrial hygienist; or
- Equipment or other items considered contaminated based on process knowledge that are to be released to another facility for work involving beryllium.

Note: Beryllium-contaminated and beryllium-containing waste does not include water or soil containing beryllium, regardless of the source.

Beryllium emergencies – Is any occurrence such as, but not limited to, equipment failure,

container rupture, or failure of control equipment or operations that result in an unexpected and significant release of beryllium.

Beryllium risk assessment – Is performed by a [Division ES&H Team](#) Industrial Hygienist to assess the foreseeable potential risk of exposure to beryllium associated with equipment and other materials; real property and buildings; and waste. Based upon the risk assessment, the decision is made to the final disposition of these materials and any conditions that should be placed for future use or handling, such as labeling, a recipient's commitment, containment, encapsulation, decontamination, disposal, release, etc.

Beryllium worker – A current worker who is regularly employed in a DOE beryllium activity.

Best management practices – The preferred methods and practices for managing operations.

Biohazardous waste – See "[Medical waste](#)."

Biohazardous Waste (California) – Any of the following wastes: human or animal specimen cultures from medical and pathology laboratories; cultures and stocks of infectious agents from research and industrial laboratories; wastes from the production of bacteria, viruses, spores, discarded live and attenuated vaccines used in human health care or research, discarded animal vaccines, including Brucellosis and Contagious Ecthyma, and culture dishes and devices used to transfer, inoculate, and mix cultures; human surgery specimens or tissues removed at surgery or autopsy suspected of being contaminated with infectious agents; animal parts, tissues, fluids, or carcasses suspected of being contaminated with infectious agents; waste containing recognizable fluid blood products, containers or equipment containing fluid blood, or blood from animals infected with highly communicable human diseases; waste contaminated with humans or animal excretion, exudate, or secretions that require isolation to protect others from highly communicable diseases.

Biological agent – Agent, biological - Includes infectious agents of humans, plants, and animals, as well as the toxins that may be produced by microbes and by genetic material potentially hazardous by itself or when introduced into a suitable vector. (From to Biosafety in Microbiological and Biomedical Laboratories (BMBL), 4th Edition, Appendix C).

Biological hazard or biohazard – means those infectious agents presenting risk of death, injury, or illness to employees.

Biological products – A biological prepared and manufactured in accordance with the provisions of 9 CFR Parts 102-104 and 21 CFR Parts 312 and 600-680 and which, in accordance with such provisions, may be shipped interstate traffic.

Biological toxin – A toxic material of biological (plant, animal, microorganism, etc.) origin that has been isolated from the parent organism or a chemically synthesized version of such a toxic

material.

Biosafety Level 1 – This level is applicable to activities involving agents that are not known to consistently cause disease in healthy adults.

Biosafety Level 2 – This level is applicable to activities involving agents that are associated with human disease, which may enter the human body by percutaneous injury, ingestion, or mucous membrane exposure.

Biosafety Level 3 – is applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic biological agents which may cause serious or potentially lethal disease as a result of exposure by the inhalation route.

Biosafety Level 4 – is required for work with dangerous and exotic biological agents that pose a high individual risk of aerosol-transmitted laboratory infections and life-threatening disease.

Biosurety Committee – A committee responsible for reviewing any proposed work with RG2 agents and/or select agents for safe handling practices and compliance with environmental, safety and health related requirements and policies; and recommending approval of work as appropriate.

Biota – The plant and animal life of a region.

Blanket permit, confined space – At SNL/NM, a confined space entry permit that is issued for a maximum of six months to allow confined space personnel to perform identical, repetitive, and routine work in a single permit-required confined space without having to obtain a separate permit from SNL/NM Industrial Hygiene for each entry. Each and every entry must still be documented on a continuation sheet.

Blood – Human blood, human blood components, and products made from human blood.

Bloodborne pathogens – Pathogenic microorganisms that are present in blood and that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus ([HBV](#)), hepatitis C virus (HCV), and human immunodeficiency virus (HIV).

Body belt – A body support component (sometimes called a waist belt or safety belt) comprised of a strap that is secured around the person's waist and attached to other components or subsystems.

Brazing – A group of joining processes that produces coalescence of materials by heating them to the brazing temperature in the presence of a filler metal having a liquidus above 450°C (840°F) and below the solidus of the base metal. The filler metal is distributed between the closely fitted faying surfaces of the joint by capillary action. (Does not include “silver soldering

or open flame soldering".)

Bubonic plague – Inflammation of the lymph nodes caused by a bacterial infection transferred from rodents and their fleas to various animals and to people.

Buddy system – Working with another person nearby who can provide immediate assistance if necessary.

Building evacuation team – Team comprised of designated [SNL personnel](#) who ensure the evacuation of all building occupants due to an emergency or an evacuation drill. Building evacuation teams are comprised of a team captain, squad members, and a fire sprinkler valve monitor.

Building manager – Individual at SNL/NM assigned to interface with a tenant(s) to address building and real property issues and to facilitate interaction between a tenant(s) and landlord. The building manager also:

- Negotiates internal lease agreements between a landlord and tenant(s).
- Maintains routine contact with tenant(s) to obtain information about current operations and future plans.
- Works with space management personnel to broker space transactions between organizations in specific subsites. Serves as liaison between tenant(s) and space management personnel for corporate-directed space transactions.
- Manages corporate space (i.e., conference rooms, lobbies, and other common space such as outside space between buildings).
- Monitors building maintenance activities, modification projects, and other activities that provide services according to internal lease agreements (ILAs).

Building profile – A brief summary of specific building systems, structure composition, identified hazards, and contact personnel, which is used by emergency response organizations during emergency and nonemergency events.

Bulk storage container: Any container used to store oil. The purpose of this container includes but is not limited to storing oil before it is used, while it is being used, or before it is distributed further in commerce. Oil-filled electrical, operating, or manufacturing equipment is not a bulk storage container.

Bulk storage tank – A stationary container or [tank wagon](#) that is filled on site and used for storing oil, fuel, or chemicals; or transformers or other electrical equipment with a minimum

capacity of 660 gallons. This term does **not** include:

- Containers that are either prepackaged or filled off site and barcoded through the [Chemical Information System \(CIS\)](#)
- Dewar containers
- Process tanks, such as etching tanks, plating baths, and cleaning baths

Business Occupancy (Office) – An operation may be considered an office use if the **hazards** are limited to those:

- Common to any work environment (e.g., tripping, slipping, falling).
- Associated with consumer products and tools that do not require personal protection equipment (PPE) (e.g., toner cartridges, paper cutter).
- Associated with building systems and utilities managed by Facilities organizations (e.g., building electrical panels).
- Associated with conditions outside of the manager's control (e.g., natural phenomena, adjacent operations).

By-Product Material – Any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material; and the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. [Source: Atomic Energy Act of 1954, as amended, section 11(e).]

C

Calendar days – The periods from midnight to midnight. Includes weekend days and holidays, as opposed to working or business days. Example: If a three-calendar-day limit is specified for storage of waste and the volume limit is exceeded at noon on a Friday, the excess waste shall be removed by noon the following Monday to remain in compliance.

Campaign mode – Operating mode assigned to a facility to temporarily shut it down for short time period while retaining its state of readiness (e.g., normal maintenance functions). This mode allows a facility to resume operations at a moments notice.

Capable of being locked out – An energy-source-isolating device is capable of being locked out if it has a hasp or other means of attachment to through which a lock can be affixed, or it has a locking mechanism built into it. Other devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-source-isolating

device or permanently alter its energy control capability.

Carcinogen – A chemical is considered to be a carcinogen if:

- It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or
- It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or
- It is regulated by OSHA as a carcinogen.

Carrier – Any person engaged in the transportation of passengers of property as a common, contract, or private carrier, or freight forwarder; or officers, agents, and employees of such carriers.

Casual Member of the Workforce – A Member of the Workforce other than an operator who intermittently visits an explosives operation for the purpose of supervision, inspection, maintenance, etc.

Categorical exclusion – Types of activities that do not impact safety analyses, such as technical content of preventive maintenance procedures.

Several types of activities may be considered for categorical exclusion:

- Activities that do not impact safety analyses, such as technical content of preventive maintenance procedures, wherein the facility is returned to the previously approved state regardless of the preventive maintenance procedure. A [USQ](#) should be prepared to explain why exclusion is acceptable and submitted to DOE for approval
- Activities or operations known to be repeatable may be addressed in a USQ in a manner to cover the exclusion in future situations
- A matter covered by a previous USQ determination Design basis - The set of requirements that bound the design for various structures, systems, and components (SSCs) with the facility. These design requirements include consideration for safety, plant availability, efficiency, reliability, and maintainability. Some aspects of the design basis are important to safety, while others are not.

Categorical process – Any regulated effluent containing pollutant discharge limits promulgated by EPA in accordance with Sections 307(b) and (c) of the Act (33 USC 1317, *Toxic and Pretreatment Effluent Standards*), which apply to a specific category of users and which appear in 40 CFR, *Protection of Environment*, Chapter I, “Environmental Protection Agency,” Subchapter N, “Effluent Guidelines and Standards,” Parts 405-471.



Category of aircraft – As used with respect to the certification, ratings, privileges, and limitations of airmen, means a broad classification of aircraft. Examples include airplane, rotorcraft, glider, and lighter-than-air.

Category 1 nuclear facility – A nuclear facility for which the hazard analysis shows the potential for significant offsite consequences.

Category 2 nuclear facility – A nuclear facility for which the hazard analysis shows the potential for significant onsite consequences.

Category 3 nuclear facility – A nuclear facility for which the hazard analysis shows the potential for only significant localized consequences.

Causal analysis (CA) - A process used to identify causal factors, and subsequently the root cause of a finding, so as to prevent recurrence of the finding. A causal analysis is less formal and less in depth than a "Root Cause Analysis." Performing an effective CA is critical to ensuring that corrective actions will prevent or greatly reduce the probability of recurrence of the issue. Without causal analysis, solutions to the deficiency may be inadequate, and the deficiency may recur.

Causal Analysis Tree (CAT) – The CAT is the required tool used in determining the apparent cause for each of the causal factors (per [DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*, Chapter 11, "Occurrence Reporting Model and Causal Analysis Tree"). The CAT has three levels "A," "B," and "C." The "A" level is the most general and the "C" level is the most specific. The "C" level is, by definition, the [apparent cause](#) and gives you the causal analysis codes.

Causal codes – Numeric codes derived by from causal factors and the causal analysis tree (see [DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*, Chapter 11, "Occurrence Reporting Model and Causal Analysis Tree"). A completed causal code has the format "ABC." The "A" code is derived from the "A" level of the CAT, the "B" code from the "B" level, and the "C" code from the "C" level. According to the DOE definitions, the "C" level code is the apparent cause. An example full causal code might be "A2B2C01."

Causal factors (DOE definition) – The causes of an incident or occurrence as determined by root cause analysis. A causal factor is an event or condition that either caused the problem under investigation, made it worse, or that may have influenced the course of the incident or that may have been a major contributor to the problem. Causal factors were formerly called the root cause, direct cause, and contributing causes.

Cause – A condition or occurrence that results in an effect.

Caution – Term used to indicate a potentially hazardous situation, that, if not avoided, **may** result in **minor or moderate** injury. It may also be used to alert against unsafe or costly practices.

CBC – Case-by-case

CCHP – *Corporate Chemical Hygiene Plan*. See the *ES&H Manual*, [Section 6E](#) "Laboratory Standard - Chemical Hygiene Plan."

CEDE – Committed effective dose equivalent

Centrally controlled lockout/tagout – Centrally controlled lockout/tagout requires a primary authorized individual to control application and removal of locks and tags. In facilities with centrally controlled lockout/tagout, the operations supervisor, facility manager, or a designee authorizes and is responsible for lock and tag application and removal, and personnel accountability.

CFC – Chlorofluorocarbon

CFR – [Code of Federal Regulations](#)

Change – Change, as used in the context of nuclear facility safety bases, includes but is not limited to:

- Changes to any structures, systems, components, or equipment within the facility.
- Changes to any operations conducted within the facility.
- Changes to procedures.
- Changes to safety documentation for the facility.
- New tests, experiments, equipment, and operations that are not described in existing safety analyses.

Change may be temporary or permanent, and it is caused by many factors, including the following:

- New criteria
- Self-assessments and inspections
- Occurrences (reportable and nonreportable)

- Nonconformances
- Discoveries of inadequacies

Change Control Board (CCB) – A panel established to review and approve requests for changes to corrective action plans.

Charter – The tasking of an aircraft operator for aircraft support through a contracting process (including the use of a company credit card).

Checklist (with respect to the startup and restart process at SNL) – An itemized list of all identified startup, operational, or shutdown criteria (e.g., hardware, personnel, and administrative controls) to be satisfied to achieve a specified state of readiness. Each criterion must be documented on a certification statement with regard to resolution and acceptance based on acceptance criteria or performance objectives prior to the readiness determination.

Checklist, nonpermit confined space – Written authorization from the [Division ES&H Team](#) to enter into a nonpermit confined space. The checklist specifies the hazards and outlines the controls required for entry.

Checklist or worksheet - A set of notes and instructions about specific areas to review, questions to ask, and methods of data gathering use during an assessment. Checklists are used to ensure continuity and comprehensive coverage of the area of interest and provide evidence of the questions that were reviewed.

Chelating agents – Amine polycarboxylic acids (e.g., EDTA, DPTA), hydroxy-carboxylic acids, and polycarboxylic acids (e.g., citric acid, carboic acid, gluconic acid), that might be used to bind radionuclides as part of a decontamination process, and which are very mobile in the environment.

Chemical – Any element, chemical compound, or mixture of elements and/or compounds.

Chemical cartridge – A container with a filter, sorbent, or catalyst, or combination of these items, that removes specific contaminants from the air passed through the container.

Chemical dependency – The psychological or physical dependence upon alcohol or other illegal or controlled substances.

Chemical Exchange Program – Program that makes chemicals, which are unopened and have not passed their expiration dates, available **free** to employees for **immediate** work purposes.

Chemical Information System (CIS) – SNL system composed of an extensive material safety

data sheet (MSDS) library and an integrated chemical inventory system, which tracks chemical containers by SNL CIS barcodes.

Chemical inventory reconciliation – A process whereby chemical containers in a specific physical location, such as a laboratory, are inventoried and compared to existing Chemical Inventory System (CIS) records. This process includes the following:

- Chemical containers with barcodes are scanned.
- Chemical containers without barcodes are coded and scanned.
 - Existing CIS records are deleted for any containers that are not found.

Chemical substance – Any organic or inorganic substance of a particular molecular identity, including:

- "Pure" chemicals.
- Chemicals contained in mixtures.
- Chemicals contained in trade name products.
- Intermediates.
- Hazardous and nonhazardous waste.
- Microorganisms and associated DNA molecules.

Note: The *Toxic Substances Control Act (TSCA)* excludes the following from the definition of a chemical substance:

- Any pesticide (as defined in 7 USC 136, *et seq.*, *Federal Insecticide, Fungicide, and Rodenticide Act*) that is manufactured, processed, or distributed in [commerce](#) for use as a pesticide.
- Any food, food additive, drug, cosmetic, or device (as defined in 21 USC 801 *et seq.*, *Federal Food, Drug, and Cosmetic Act*, as amended.) that is manufactured, processed, or distributed in [commerce](#) for use as a food, food additive, drug, cosmetic, or device.
- Any source material, special nuclear material, or byproduct material (as defined in 42 USC 2011 *et seq.*, *Atomic Energy Act of 1954*, as amended).
- Tobacco or any tobacco products.
- Firearms and shells (defined as an article subject to the tax imposed by Section 4181 of 26 USC, *Internal Revenue Code of 1954*).

Chemically compatible – The chemical property of material to coexist without adverse reaction for an acceptable time period (e.g., a container's lining must not react with or be affected by the container's contents).

Circular saw – A machine equipped with a thin steel disc having a continuous series of notches or teeth on the periphery, mounted on shafting, and used for sawing materials.

Class I flammable liquid – Any flammable liquid having a flash point of less than 100 degrees Fahrenheit.

Class 1 laser – Laser or laser system that does not emit hazardous laser energy during normal operation.

Class 2 laser – Laser or laser system that produces visible beams that can emit hazardous, accessible radiant power (not skin hazards) over long viewing times. An individual's blink provides protection against short-term exposures.

Class 3a laser – Laser or laser system that almost always produces visible beams that create eye hazards during chronic viewing or viewing through focusing optics. An individual's blink reflex provides protection against short-term exposures.

Class 3b laser – Laser or laser system that is capable of producing permanent eye damage. An individual's blink reflex does **not** provide protection against short intrabeam exposures. However, the diffuse beam is not considered an eye hazard. Direct beam contact may result in skin damage.

Class 4 laser – Laser or laser system that is capable of producing permanent eye damage. An individual's blink does **not** provide protection against short intrabeam or diffuse reflection exposures. Direct beam contact may result in skin damage and may ignite fires.

Class I ozone-depleting substance (ODS) –

- Group I:
 - chlorofluorocarbon-11 (CFC-11)
 - chlorofluorocarbon-12 (CFC-12)
 - chlorofluorocarbon-113 (CFC-113)
 - chlorofluorocarbon-114 (CFC-114)

- Group II:

- halon-1211
- halon-1301
- halon-2402

- Group III:

- chlorofluorocarbon-13 (CFC-13)
- chlorofluorocarbon-111 (CFC-111)
- chlorofluorocarbon-112 (CFC-112)
- chlorofluorocarbon-211 (CFC-211)
- chlorofluorocarbon-212 (CFC-212)
- chlorofluorocarbon-213(CFC-213)
- chlorofluorocarbon-214 (CFC-214)
- chlorofluorocarbon-215 (CFC-215)
- chlorofluorocarbon-216 (CFC-216)
- chlorofluorocarbon-217 (CFC-217)

- Group IV:

- carbon tetrachloride

- Group V:

- methyl chloroform

Class II ozone-depleting substance (ODS) –

- hydrochlorofluorocarbon-21 (HCFC-21)
- hydrochlorofluorocarbon-22 (HCFC-22)
- hydrochlorofluorocarbon-31 (HCFC-31)
- hydrochlorofluorocarbon-121 (HCFC-121)
- hydrochlorofluorocarbon-122 (HCFC-122)





- hydrochlorofluorocarbon-123 (HCFC-123)
- hydrochlorofluorocarbon-124 (HCFC-124)
- hydrochlorofluorocarbon-131 (HCFC-131)
- hydrochlorofluorocarbon-132 (HCFC-132)
- hydrochlorofluorocarbon-133 (HCFC-133)
- hydrochlorofluorocarbon-141 (HCFC-141)
- hydrochlorofluorocarbon-142 (HCFC-142)
- hydrochlorofluorocarbon-221 (HCFC-221)
- hydrochlorofluorocarbon-222 (HCFC-222)



- hydrochlorofluorocarbon-223 (HCFC-223)
- hydrochlorofluorocarbon-224 (HCFC-224)
- hydrochlorofluorocarbon-225 (HCFC-225)
- hydrochlorofluorocarbon-226 (HCFC-226)
- hydrochlorofluorocarbon-231 (HCFC-231)
- hydrochlorofluorocarbon-232 (HCFC-232)
- hydrochlorofluorocarbon-233 (HCFC-233)
- hydrochlorofluorocarbon-234 (HCFC-234)
- hydrochlorofluorocarbon-235 (HCFC-235)



- hydrochlorofluorocarbon-241 (HCFC-241)
- hydrochlorofluorocarbon-242 (HCFC-242)
- hydrochlorofluorocarbon-243 (HCFC-243)
- hydrochlorofluorocarbon-244 (HCFC-244)
- hydrochlorofluorocarbon-251 (HCFC-251)
- hydrochlorofluorocarbon-252 (HCFC-252)
- hydrochlorofluorocarbon-253 (HCFC-253)

- hydrochlorofluorocarbon-261 (HCFC-261)
- hydrochlorofluorocarbon-262 (HCFC-262)
- hydrochlorofluorocarbon-271 (HCFC-271)

Classroom instructor – The classroom instructor/trainer is typically an individual who works occasionally or full-time as an instructor. This title covers a broad range of instructors varying from an organization SME --working part-time as a classroom instructor using instructional materials and strategies developed by others-- to an individual who performs most of the duties of an instructional technologist. The classroom instructor should have a working knowledge of the concepts of a systematic approach to training. A training course for the classroom instructor should emphasize the "how to" and the "why." It is not necessary to have completed OJT instructor training to qualify as a classroom instructor .

Cleanup operation – Operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared-up, or in any other manner processed or handled with the ultimate goal of making the site safer for people or the environment. This does not include daily or routine cleaning or decontamination of a chemistry laboratory or cleanup of incidental releases of hazardous substances (see definition of "[emergency response](#)" for more information).

Close Call/Injury Illness – An incident in which minor or no personal injury was sustained but, given a slight shift in time or position, an *OSHA Recordable or Serious Injury* could have occurred.

Clean Water Act (CWA) – Federal statute that dictates regulation of pollutants from sources to any waters of the U.S.

Closed container – A primary or outer container of hazardous waste that will not allow any waste to escape into the environment, even if the container is overturned. Examples include step cans located at inside locations where, if overturned, waste will not escape into the outside environment and drums with covered funnels screwed into the bung opening.

Closed cycle cryogenic system – An application where the fluid is operated in a completely contained system without intentional vents of the system fluid. An example would be a typical UHV cryogenic pump employing a helium compressor where normal operation vents no helium from the system and SNL personnel are not exposed to cryogenic hazards.

Closed handling of cryogenics – The transfer of cryogenic liquids within piping systems and into covered dewars or enclosed temperature chambers with controlled venting of the boil-off gases. In closed handling of cryogenics, personnel are not exposed to liquid splashes or sprays. The venting from these systems may be to the outdoors, into building exhaust systems, or into

the building air space for limited flow or limited volume applications.

Closeout report (with respect to the startup and restart process at SNL) – A report that documents closure of any open findings from the final report.

Cold injury – Injuries to body extremities, caused by overexposure to cold and/or damp conditions, such as [trench foot](#), chilblains, frostnip, [frostbite](#), etc.

Cold stress – The net heat loss to which a worker may be exposed from the combined contributions of metabolic cost of work, environmental factors, and clothing requirements.

Cold stressor – A stimulus that has the potential to decrease the core body temperature <link to new glossary term> of an individual.

Collection area – A temporary staging area for the centralization of small volumes of low hazard "like" waste to facilitate pickup by waste management personnel.

Combustible liquid – Any liquid having a flashpoint at or above 100 °F (37.8 °C), but below 200 °F (93.3 °C), except any mixture having components with flashpoints of 200 °F (93.3 °C), or higher, the total volume of which make up 99% or more of the total volume of the mixture.

Commerce – Trade, traffic, transportation, or other transaction:

- Between a place in a state and any place outside of that state.
- Which affects trade, traffic, transportation, or commerce between a place in a state and any place outside of that state.

Commercial Chemical Product – Commercial chemical product is a chemical substance which is manufactured or formulated for commercial or manufacturing use. It consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient.

Commercial driver's license– a license issued to an individual by a state or other jurisdiction in accordance with the standards contained in [49 CFR, 383](#), *Commercial Driver's License Standards; Requirements and Penalties*, which authorizes the individual to operate a class of commercial motor vehicle.

Commercial motor vehicle (CMV) –

1. Any self-propelled or towed motor vehicle used on highways in interstate commerce to transport passengers or property when the vehicle (a) has a gross vehicle weight rating (GVWR), gross combination weight rating (GCWR), gross vehicle weight (GVW), or gross

combination weight (GCW) of 4,536 kg (10,001 pounds) or more, whichever is greater; or (b) is designed or used to transport more than 8 passengers, including the driver, for compensation; or (c) is designed or used to transport more than 15 passengers, including the driver, and is not used to transport passengers for compensation; or (d) is used in transporting material found by the Secretary of Transportation to be hazardous under 49 USC 5103 and transported in a quantity requiring placarding under regulations prescribed by the DOT Secretary under 49 CFR, Subtitle B, Chapter I, Subchapter C (49 CFR 390.5).

2. A motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the motor vehicle (a) has a GCWR of 11,794 kg (26,001 pounds) or more inclusive of a towed unit with a GVWR of more than 4,536 kilograms (10,000 pounds); or (b) has a GVWR of 11,794 kg (26,001 pounds) or more; or (c) is designed to transport 16 or more passengers, including the driver; or (d) is of any size and is used in the transportation of material found to be hazardous for the purposes of the Hazardous Materials Transportation Act (49 USC, Appendix 1801-1813) and which requires the motor vehicle to be placarded under the hazardous materials regulations (49 CFR 382.107 and 383.5).

Note: The Federal Motor Carrier Safety Regulations (FMCSR) begin with a GVWR of 10,001 pounds or more (see 1a above). However, this threshold is changed to 26,001 pounds or more for both controlled substances/alcohol standards and commercial driver's license (CDL) standards. It may be useful to classify the differences into two groups: vehicle-related and alcohol-related.

Examples of CMVs include:

- 1-ton stake vehicle
- Large panel truck
- Trash compactor and dumpster
- Dump truck
- Semi-truck
- Semi-trailer (B-numbered trailer, mobile office, or lab trailer)
- 16-passenger van (SNL/NM)
- 10-passenger van (SNL/CA)
- Any vehicle carrying hazardous material that requires a placard

Commercial motor vehicle—interstate (between states) [packaging and transportation

definition] – Any self-propelled or towed motor vehicle, or combination of motor vehicles, used on a highway in interstate commerce to transport passengers or property when the motor vehicle:

- Has a gross vehicle weight rating or gross combination weight rating, or gross vehicle weight or gross combination weight of 4,536 kg (10,001 pounds) or more, whichever is greater; **or**
- Is designed or used to transport more than 8 passengers (including the driver) for compensation; **or**
- Is designed or used to transport 15 passengers (including the driver) and is not used to transport passengers for compensation; **or**
- Is used to transport material that is found by the Secretary of Transportation to be hazardous under 49 CFR, *Transportation*, and that is transported in a quantity requiring placarding under regulations prescribed by the Secretary under [49 CFR, 390.3](#), *Federal Motor Carrier Safety Regulations; General—General Applicability*.

Commercial motor vehicle—intrastate (within the state) [packaging and transportation definition] – A motor vehicle, or combination of motor vehicles, used in commerce to transport passengers or property if the motor vehicle :

- Has a gross combination weight rating of 11,794 kilograms or more (26,001 pounds or more), inclusive of a towed unit(s), with a gross vehicle weight rating of more than 4,536 kilograms (10,000 pounds); **or**
- Has a gross vehicle weight rating of 11,794 or more kilograms (26,001 pounds or more); **or**
- Is designed to transport 16 or more passengers, including the driver; **or**
- Is of any size and is used in the transportation of [hazardous materials](#) requiring placarding.

Commercial purposes – TSCA defines this term as the import, production, or manufacture of a chemical substance or article to obtain an immediate or eventual commercial advantage for the manufacturer or importer.

Commercial solid waste – Per 20 NMAC 9.1, commercial solid waste includes all types of solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities, excluding residential, household and industrial wastes. At SNL, such waste includes office trash, packaging material, empty containers, cardboard, newspaper, broken glass, and food debris.

Commercial underwater diving – Act of entering and descending beneath the surface of a body of water to perform assigned tasks which may include manual placement or movement of heavy objects underwater, construction, demolition, inspection, and the use of explosives. Underwater diving conducted by SNL personnel is referred to as "commercial diving."

Compatibility – The chemical property of material to coexist without adverse reaction for an acceptable time period.

Compatible – May be placed in a particular process, container or facility without causing corrosion or decay of containment materials (e.g., container inner liners or tank walls), will not produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases or flammable fumes or gases when commingled with other wastes with similar hazard characteristics.

Competency – The ability of a person to perform job responsibilities.

Competent Members of the Workforce– Members of the Workforce who, by way of training and/or experience, are knowledgeable of applicable standards, are capable of identifying workplace hazards relating to the specific operation, and have authority to take appropriate actions.

Compressed gas – Includes any of the following:

- i. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 °F (21.1 °C)
- ii. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 °F (54.4 °C) regardless of the pressure at 70 °F (21.1 °C)
- iii. A liquid having a vapor pressure exceeding 40 psi at 100 °F (37.8 °C) as determined by ASTM D-323-72. See definition of "[physical hazard](#)."

Condition – Any as-found state, whether or not resulting from an event, that may have adverse safety, health, quality assurance, security, operational, or environmental implications.

Confined space – A space that has limited or restricted openings for entry and exit; is **not** designed for continuous human occupancy; and is large enough and configured so that a person can bodily enter the space and perform assigned work.

Examples of confined spaces include, but are **not** limited to boilers, furnaces, degreasers, storage tanks, test chambers, vessels, diked areas, tunnels, pits, vats, sewers, underground utility vaults, manholes, hoppers, silos, stacks, pipelines, septic tanks, trenches, bunkers, equipment housings, etc.



(See also "[permit required confined space](#)" and "[non-permit confined space](#).")

Consequence – The result produced when a hazard is transmitted to a receptor (e.g., people, property, environment), is absorbed by the receptor, and produces an undesired effect in the receptor.

Construction – Any combination of erection, installation, assembly, demolition, or fabrication activities to create a new facility or to alter, add to, rehabilitate, dismantle, or remove an existing facility. It also includes the alteration or repair (including dredging, excavating, and painting) of buildings, structures, or other real property, as well as any construction, demolition, and excavation activities conducted as part of environmental restoration (ER) or remediation efforts.

Construction-like activities – Small-scale construction activities of short duration, such as those related to test and experiment setups, environmental sampling, and environmental restoration (ER). The following are a few examples:



- Scaffold erection
- Pouring of concrete pads or foundations
- Use of mobile cranes in equipment erection
- Excavations more than four feet deep

Construction and demolition debris – Waste from construction and demolition projects, generally considered to be non-water soluble and non-hazardous in nature, including, but not limited to, steel, glass, brick, concrete, asphalt roofing materials, pipe, gypsum wallboard and lumber from the construction or destruction of a structure project, and includes rocks, soil, tree remains, trees and other vegetative matter that normally results from land clearing.

Construction and demolition debris does not include asbestos or liquids, including but not limited to, waste paints, solvents, sealers, adhesives or potentially hazardous materials.



Consumer product or hazardous substance – Any consumer product or hazardous substance, as those terms are defined in the *Consumer Product Safety Act* (15 U.S.C. 2051 *et seq.*) and *Federal Hazardous Substances Act* (15 U.S.C. 1261 *et seq.*) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.

Container – A chemically and physically compatible receptacle to accumulate, identify, and safely handle waste.

Contaminated buildings and areas – Is real property, buildings and areas the appropriate Division ES&H Team industrial hygienist has determined to be contaminated with removable beryllium based on an upper tolerance limit (UTL 95%,95%) calculated from random representative surface wipe samples exceeding 0.2 micrograms beryllium per 100 square centimeters ($\mu\text{g Be}/100 \text{ cm}^2$) when beryllium is not from soil accumulation or other natural sources; or buildings and areas the appropriate Division ES&H Team industrial hygienist has determined to be contaminated based on documentation of contamination from a known past beryllium activity; and there are no current beryllium activities being performed. On going beryllium activities are captured in the definition of beryllium activity and/or operational area

Contaminated, bloodborne pathogens – The presence or the reasonably anticipated presence of blood or [other potentially infectious material \(OPIM\)](#) on an item or surface.

Contaminated laundry – Laundry that has been soiled with blood or [other potentially infectious material \(OPIM\)](#) or that may contain [contaminated sharps](#).

Contamination – The unwanted presence of radioactive material, as debris, dust or liquids, on surfaces.

Contamination area – Any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed the removable surface contamination values specified in [Appendix D](#) of [MN471016](#), *Radiological Protection Procedures Manual*, but do not exceed 100 times those values.

Contingency - An unlikely change in a process condition important to the criticality safety of a FMO. A contingency is an undesired, upset condition.

Continuous, unattended hazardous operation – A test or operation that is unattended for a period of four hours or more **and** poses a fire, explosion, water leakage, or smoke or electrical hazard.

The following systems and equipment are not considered continuous or unattended hazardous operations:

- Building systems (such as heating, air conditioning, and telephone systems)
- Systems that are commercially designed for continuous operation and are approved by Factory Mutual or listed by Underwriters Laboratories for their intended use (such as refrigerators, VCRs, PCs, VDTs, fax machines, etc.)

Contract scope of work – Portion of a contract package that includes a complete description of work to be completed by a contractor.

Contractor – The seller or the other party to the contract or agreement with SNL.

Contractor-directed contracts – Those contracts placed with companies that have management expertise, financial resources, and technical capabilities in the area of expertise required at Sandia. The companies' expertise is sufficient that 1) its management is active in the contract performance and capable of taking high level direction via the contract and translating that direction into appropriate work assignments to ensure satisfactory completion of the job; 2) Sandia interaction with the work performance of the companies' personnel is generally limited to contract monitoring such as by a Sandia Delegated Representative (although Sandia retains the right to make corrections and perform inspections as necessary to ensure compliance with contract requirements); and 3) customary business and technical interactions between Sandia and the company are normally carried out at the management levels of the companies' staff.

Contractor, onsite – Contractors and their individuals who perform such work as is paid for by SNL and who work under the direction of an SNL employee pursuant to the terms of the contract.

Contractors, construction – Craftworkers such as electricians, welders, carpenters, plumbers, and steam fitters who perform activities, such as erection, installation, renovation, and demolition and who are **not** under the direct supervision of an SNL employee.

Contractors, service – Contractor personnel who perform short-duration activities requested by an SNL employee. Activities included are equipment servicing and installation and the modification of test or building facilities.

Contributing cause – A cause that contributed to an occurrence or condition but, by itself, would not have caused the occurrence or condition. A contributing cause, if corrected, may prevent occurrence or recurrence.

Control measure – Measures that include [engineering controls](#), [administrative controls](#), and the use of [personal protective equipment \(PPE\)](#) and hygiene practices. Particular attention shall be given to the selection of control measures for chemicals that are known to be particularly hazardous.

Controlled access area – Access to onsite roadways is controlled if temporary or permanent physical access control barriers are provided. Examples of physical barriers include fences, DOE- or contractor-controlled guard gates, and security roadblocks. Passive barriers, such as signs, do not provide controlled access.

[Controlled area](#)

Controller – A person trained in firearms activities who helps to ensure that exercises are conducted safely and that all participants follow rules.

Conventional fall protection – A conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system).

Core body temperature – The internal temperature of the human body, which is normal at 37.6 ° C via rectal thermometry.

Corrective action - An action identified to correct a finding that, when completed, fixes the problem or prevents recurrence.

Corrective Action Management Program (CAMP) – The Sandia National Laboratories program for managing and reporting on corrective action plans (CAPs).

Corrective Action Management Program (CAMP) Project Lead – The individual who coordinates communications for resolution of findings, identified issues, or observations. This individual also submits evidence packages for closure of findings to the Sandia Site Office (SSO) and Org. 12870.

Corrective Action Plan (CAP)– The solution plan of a finding or "identified" issue. The CAP must contain clear and concise milestone completion criteria and include, when appropriate, documented root cause analysis and risk assessment.

Corrective Actions Tracking System (CATS) – This is an internal database that tracks ES&H and EM findings, observations, and opportunities for improvement.

Corporate Education, Development and Training (CEDT) – The CEDT is comprised of three departments: Technical and Compliance Training (3521), Education Training Development & Operations (3520-1), and Business, Leadership, & Management Development (3522).

Corrosive (RCRA) – An acidic ($\text{pH} \leq 2$) or basic ($\text{pH} \geq 12.5$) material, or material that alters skin tissue or metal at the point of contact.

Corrosive material – A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact.

CRADA – Cooperative research and development agreement

Crane – A machine for lifting and lowering a load and moving it horizontally with the hoisting mechanism an integral part of the machine.

Credible – The attribute of being believable on the basis of commonly acceptable engineering judgment. Due to the general lack of statistically reliable data, assigning numerical probabilities to events is not justifiable and when used should be backed up with references ([DOE-STD-3007-2007](#)).

Criteria (with respect to the startup and restart process at SNL) – A formalized list of prerequisite detailed conditions or issues that must be satisfied to achieve the specified state of readiness.

Criteria and Review Approach Document (CRAD) – A document that specifies core requirements that are to be measured and how they are to be measured. Evaluation methods may include document review, interview, walkdown, etc., to derive objective evidence and measure the readiness of a particular objective.

Criticality Accident Alarm System (CAAS) – an alarm system that warns of a [nuclear criticality accident](#) and meets requirements such as in the ANSI/ANS-8.3 standard.

Criticality index (CI) – Synonymous with [Criticality Safety Index \(CSI\)](#), which is the preferred term at Sandia.

Criticality safety assessment (CSA) – Criticality Safety Assessments may be required by the [NCS Program](#) to establish the fact that proposed [fissile material operations](#) will remain safely subcritical under all normal conditions and postulated credible process upset or contingent conditions (contingencies). This is done by considering the amounts, forms, and types of [fissile material](#) used in the system or process, establishing parameters that affect NCS, and setting limits or controls on those parameters.

Criticality Safety Evaluation (CSE) – See Criticality Safety Assessment (CSA) for Sandia applications.

Criticality safety index (CSI) – The CSI is a parameter used within the [NCS Program](#) to establish the criticality safety of packaged [fissile materials](#) during transport or storage. The CSI is the NCS-based component of the [transport index](#) as described in [10 CFR 71.59](#). The CSI depends on various characteristics, such as the fissile mass, moderation and container dimensions and construction.

Criticality safety officer (CSO) – An officer with responsibilities for NCS under the [NCS Program](#). The CSO may be contacted via the [ES&H Direct Access Services List](#) or the [CSO's website](#).

Cross country – Flying under simulated or actual instrument flight rules (IFR) conditions on

federal airways or as routed by the Aircrew Training Command (ATC), including one flight of at least 100 nautical miles and variable omni range (VOR), automatic direction finder (ADF), and instrument landing system (ILS) approaches at different airports.

Cryogenic fluid (or cryogen) – A fluid that has a normal boiling point below - 150° F.

Cumulative trauma disorders (CTDs) – Soft tissue disorders of the muscles, nerves, tendons, and related tissues.

Customs territory of the U.S. – Term defined in 19 CFR 101.1(e) to describe a geographic area that includes the U.S., the District of Columbia, and Puerto Rico.

Cutaneous hazards – Chemicals which affect the dermal layer of the body.

Curie – The basic unit used to describe the intensity of radioactivity in a sample of material. The curie is equal to 37 billion disintegrations per second, which is approximately the rate of decay of one gram of radium. A curie is also a quantity of any radionuclide that decays at a rate of 37 billion disintegrations per second.

CWDR – Chemical/material waste disposal request

D

Danger – Term used to indicate an imminently hazardous situation that, if not avoided, **will** result in **death or serious injury**. This signal word is to be limited to the most extreme situations.

DAR – See definition of "[designated airworthiness representative \(DAR\)](#)."

Data package – A permanent file intended to last the life of a pressure system. All pressure systems require a data package to document compliance with [MN471000](#), *Pressure Safety Manual*.

Debris – means solid material exceeding a 60 mm particle size that is intended for disposal and that is: A manufactured object; or plant or animal matter; or natural geologic material. However, the following materials are not debris: Any material for which a specific treatment standard is provided in Subpart D, Part 268, namely lead acid batteries, cadmium batteries, and radioactive lead solids; Process residuals such as smelter slag and residues from the treatment of waste, wastewater, sludges, or air emission residues; and Intact containers of hazardous waste that are not ruptured and that retain at least 75% of their original volume. A mixture of debris that has not been treated to the standards provided by Sec. 268.45 and other material is subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based on visual



inspection.

Decommissioning – Those actions taking place after deactivation of a nuclear facility to retire it from service and includes surveillance and maintenance, decontamination, and/or dismantlement.


Declassification – A determination by appropriate authority that information or documents and material no longer require protection as classified information against unauthorized disclosure in the interests of national security.

Defense-in-depth accident prevention – Defense-in-depth accident prevention is a philosophy that relies on a multilevel approach to the design of safety functions to reliably terminate or mitigate the consequences of an accident. The defense-in-depth philosophy builds upon the levels of safety so that no one level by itself, no matter how good it is, is completely relied upon. The first level of safety is that all significant systems, structures, and components (SSCs) be designed and built with a high level of quality such that the equipment performs its required functions with a high tolerance against malfunction or degradation. If the first level of safety is compromised, the second level of defense-in-depth (e.g., alarms and automatic safety systems) is activated to shut down the progression of the event before a true accident situation exists.

Deputy laser safety officer (DLSO) – An individual in a line organization, appointed by their manager. DLSOs are responsible for assisting in the implementation of the Laser Safety Program within their organization.

DER – See definition of "[designated engineering representative \(DER\)](#)."

Design basis – The set of requirements that bound the design for various structures, system, and components (SSCs) with the facility. These design requirements include consideration for safety, plant availability, efficiency, reliability, and maintainability. Some aspects of the design basis are important to safety, while others are not.



Design basis accidents – Those accidents that are considered credible enough to be postulated for the purposes of establishing design and performance requirements for structures, systems, and components important to safety.

Designated airworthiness representative (DAR) – An FAA licensed designated airworthiness representative, capable of certifying the airworthiness of aircraft or aircraft modifications.

Designated area – Area that may be a hood, glove box, portion of a laboratory, or an entire laboratory; is posted and its boundaries clearly identifiable; and may be undesignated with appropriate decontamination.

Designated-Authorized-Worker (DAW) – An authorized worker, designated by the manager who owns the lockout procedure being performed, to be held responsible for the lockout/tagout of the equipment or system being serviced or maintained and all Members of the Workforce performing that servicing or maintenance. The DAW is responsible for the safety of a given work specialty crew on a given shift, an entire work shift (and their DAWs) when multiple specialties are performing servicing during a given shift, or an entire job when multiple shifts (and their DAWs) are performing servicing. There are three levels of DAWs:

- Craft DAW – The DAW for a given craft on a given shift.
- Shift DAW – The supervisor when multiple crafts perform on a given shift.
- Job DAW – The superior to the shift DAW when multiple shifts perform on a given day or for an extended period.

Note: When only one craft and one shift perform the operation, the craft-DAW would be the job-DAW. When only one shift performs with multiple crafts, the shift-DAW would be the job DAW.

Assuming three levels of DAW, the supervising DAW would lock out the energy sources and place the keys to those locks into the job-lockbox. That DAW would apply an additional lock to that same lockbox, keeping the key on his person. Subordinate DAWs (i.e., shift) would apply their lock/tag to the job-lockbox and place the key into their (i.e., shift) lockbox. The subordinate DAW would then apply an additional lock/tag to their (i.e., shift) lockbox, keeping that key on their person. At the lowest lockbox level, each authorized worker would apply their lock/tag to that final lockbox, keeping the key on their person.

Designated engineering representative (DER) – An FAA licensed designated engineering representative, capable of certifying aircraft modifications under 14 CFR 23, 14 CFR 25, 14 CFR 27, and 14 CFR 29.

Designated safe work zones – Related to fall protection for low -sloped roofs, it is a work area outlined on the walking/working surface by tape, paint, chalk, or a warning line where the MOW can work safely while being watched by a MOW designated as a safety-monitor.

Dewar – A storage or experimental vessel designed for use with cryogenic liquids

Diagnostic specimens – Any human or animal material including, but not limited to, excreta, secreta, blood and its components, tissue, and tissue fluids being shipped for purposes of diagnosis.

Direct cause – The cause that directly resulted in the occurrence.

Discharge – Any liquid or solid that flows or is placed on or onto any land or into any water. This includes precipitation discharges to the storm drains, accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of any material or substance on or into any land or water.

Disposal, appliances using ozone-depleting substances – The EPA's definition of disposal, when referring to appliances that use a class I or class II substance as a refrigerant, means any process leading to and including:

1. Disassembling any appliance for reuse of its component parts or to do with its parts.
2. Discharging, depositing, dumping or placing any discarded appliance, or any parts of a disassembled appliance, into or on any land or water.

Disposal (RCRA) – The discard of an unwanted material by discharge, deposit, injection, dumping, spilling, leaking or placing of a waste into or on any land or water.

Disposal arrangements – The profiling, disposal contracting/purchase requisitions, packaging, marking, labeling, manifesting, and offering waste for offsite transportation.

Disposal facility – A facility where waste is intentionally placed into or on any land or water, and at which waste will remain after closure.

Distribute (or distribution) – To transport a chemical substance or mixture or article containing a chemical substance or mixture to other distributors or from one state to another.

Distribution (TSCA) – To distribute in commerce. Distribute in commerce means the selling, introducing, or delivering a chemical substance, mixture, or article containing a chemical substance or mixture, into commerce, or holding the chemical substance, mixture, or article containing a chemical substance or mixture after its introduction into commerce.

Division ES&H Team – A multidisciplined group of subject matter experts (SMEs) assigned to a division to provide real-time, onsite technical advice on ES&H issues.

DLSO – Deputy laser safety officer

Documented safety analysis (DSA) – a documented analysis of the extent to which a nuclear facility can be operated safely with respect to workers, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety.

DoD – Department of Defense

DOE – Department of Energy

DOE/AL – DOE Albuquerque Operations Office

DOE/KAO – DOE Kirtland Area Office

DOE Nuclear Safety Requirements – The set of enforceable rules, regulations, and orders relating to nuclear safety adopted by DOE (or by another agency if DOE specifically identifies the rule, regulation, or order) to govern the conduct of persons involved in DOE nuclear activities. This includes any programs, plans, or other provisions intended to implement these rules, regulations, orders, and nuclear statutes/acts. This also includes [technical safety requirements \(TSRs\)](#) for hazard category 1,2, or 3 DOE nuclear facilities.

DOE/NV – DOE Nevada

DOE Safety Requirements – The set of enforceable rules, regulations, and orders relating to nuclear safety and worker safety and health adopted by DOE (or by another agency if DOE specifically identifies the rule, regulation, or order) to govern the conduct of persons involved in DOE work activities. This includes any programs, plans, or other provisions intended to implement these rules, regulations, orders, and statutes/acts.

Dose assessment – The process of determining radiological dose and uncertainty included in the dose estimate through the use of exposure scenarios, bioassay results, monitoring data, source term information, and pathway analysis.

Dose equivalent – The product of the absorbed dose (D) (in rad or gray) in tissue, a quality factor (Q), and all other modifying factors (N). Dose equivalent is expressed in units of rem (or sievert) (1 rem = 0.01 sievert).

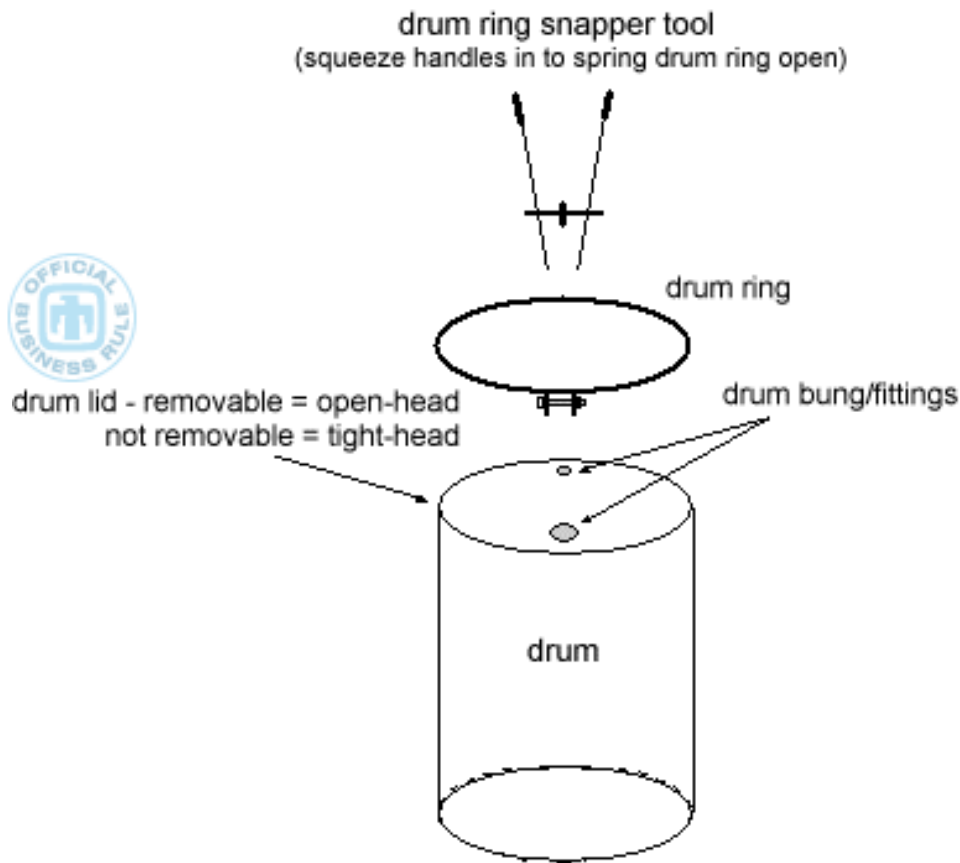
DOT – U.S. Department of Transportation

DOT hazardous material regulations – Federal regulations that apply to the interstate (and, in some cases, intrastate) transportation of hazardous material or substances and hazardous waste in commerce.

Double-contingency principle – An NCS principle stating that process designs shall incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible.[ANSI/ANS-8.1-1998]

DP – Defense programs

Drum – A storage container having a cylindrical body and covered ends, usually made of metal or fiber material. One end is fixed and the other is removable for placing and removing contents. The most common drum has a capacity of 55 gallons, but drums having other capacities are used at SNL.



Two basic styles of drums exist:

- Tight-head (or non-removable head), with permanently attached top and bottom heads
Tight-head drums (and pails) have their top and bottom heads mechanically rolled (seamed) in multiple layers to the body using a non-hardening seaming compound to form a joint (chime).
- Open-head (or removable head), in which the removable top head or cover is secured by using a separate closing ring with either a bolted or lever-locking closure.

Expanded rolling hoops (i.e., swedges) in the drum body stiffen the cylinder and provide a low-friction surface for rolling filled containers.

Two openings, one 2 in. (51 mm) and the other $\frac{3}{4}$ in. (19 mm), for filling and venting are usually provided in the top head, although side openings and other opening combinations and sizes are sometimes used. The openings are fitted with mechanically inserted threaded flanges conforming with American National Pipe thread standards. Threaded plugs for insertion in the flanges are made of steel or plastic and have resilient gaskets where appropriate. On full-

removable-head drums, the top of the body sidewall is rolled outward to form a follow curl (false wire) to which the top head or cover is attached using a gasket of resilient material and a separate closing ring.

Drum bung/fitting – A bung is a plug that installs into a threaded port on the drum lid. The bung typically has a rubber or poly type of gasket to provide a seal. Typical fitting sizes are $\frac{3}{4}$ inch and 2 inch diameters.

Drum faucet – A valve that is installed (typically into the drum lid) for the purpose of dispensing the product and can also be used as a vent valve to equalize the drum pressure.

Drum ring – A clamp type of ring that is used to attach and seal a drum lid onto an open-head drum. The clamp typically uses a nut and bolt to secure the ring onto the drum.

Drum ring snapper tool – A tool for installing or removing drum rings. The tool reduces the risk of injury from pinch points when handling drum rings and allows the operator a convenient way to stay back from the lid when opening.

Drum web – A safety device consisting of straps that grip the outside diameter of the drum and extend across the top of the lid to catch it in the event of the lid being propelled into the air by internal pressure upon removal of the lid.

E

EA – Environmental assessment

Earth moving equipment – Equipment used to perform any of the following:

- Push, fill, dump, trench, and dig land
- Scrape snow and ice
- Excavate earth

ECL/ADM – Environmental checklist/action description memorandum

EIS – Environmental impact statement

EIS/ROD – Environmental Impact Statement/Record of Decision.

Elective course – Course that is not a requirement, but is recommended for an individual to complete.

Electrical hazard – Includes, but is not limited to, parts of electrical circuits operating at 50 volts or greater that are not guarded to protect personnel from accidental contact.

Electrical worker – A qualified person assigned to electrical or electronic work who uses electrical equipment or instruments other than hand tools or typical office equipment.

Electronic Technical Work Document (eTWD) - An optional web-based electronic tool that can be used in planning work and in developing [technical work documents \(TWDs\)](#). A completed eTWD is a working-level document that defines and communicates controls that mitigate potential ES&H hazards associated with work activities or facilities. An eTWD may be used in lieu of paper-version TWDs, e.g., Confined Space Permit (CSP). (Access the eTWD tool)

Elevated surface – A surface at least four feet above ground level that is accessible, but not designed to be a working surface and is usually accessed for non-routine types of tasks only. Elevated surfaces include roofs, towers, storage tanks, and structural beams.

Elevated work – Work performed at a height greater than four feet.

Elevated working surface – A working surface that is at least four feet above ground level. Elevated working surfaces differ from elevated surfaces in that, because SNL personnel perform routine tasks on them, they are equipped with fall prevention devices such as guardrails and are designed to support the weight of and accommodate both the equipment located on them and SNL personnel who work with that equipment. Examples include work performed on roofs, storage tanks, structural beams, ladders, scaffolding, or aerial lifts.


Elevating work platform – Equipment that telescopes, articulates, rotates, or extends beyond the base dimensions to position personnel and tools at elevated locations. Elevating work platforms may be vehicle-mounted or boom-supported and are either manually- or self-propelled.

Emergency – An unplanned, significant event or condition that requires time-urgent actions from emergency response resources to ensure the:

- Health and safety of Members of the Workforce and the public.
- Protection of the environment.
- Security of operations.

Emergency, foreseeable – Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that could result in an uncontrolled release of a hazardous chemical into the work area.


Emergency management – The development, coordination, and direction of planning, preparedness, and readiness assurance activities.



Emergency, medical – Life-threatening illness or injury, or a serious accident (for example, chest pain, difficult breathing, unresponsiveness, or a debilitating fracture).

Emergency action plan – An [emergency plan](#) prepared by managers who are responsible for ten or more workers within a facility or building. The emergency action plan includes procedures for reporting emergencies, evacuations, accountability for visitors and Members of the Workforce, and critical task performances. See Chapter 15, "Emergency Preparedness and Management," for additional information.

Emergency occurrence – Emergencies are the most serious occurrences, requiring an increased awareness status for site personnel and, in specified cases, for off-site authorities. Specifically, qualifying operational emergencies are significant events or conditions that pose a significant hazard to safety, health, or the environment and require time-urgent response from outside the immediate area or affected facility/site. At SNL, an operational emergency can be declared by the senior management representative (SMR) or an on-duty incident commander during an actual activation of the Emergency Operations Center (EOC).



Emergency response – A response effort by employees from outside the immediate release area or by other designated responders (e.g., mutual aid groups, local fire departments) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel are not considered to be emergency responses. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, chemical exposure) are not considered to be emergency responses.

Emergency response personnel – Members of the Workforce who are:

- Trained in emergency response actions.
- Certified by the Emergency Management Department.
- Authorized to direct or initiate actions to mitigate the consequences of an emergency.

Examples are:

- Incident Commanders.
- Rescue and Recon Team.

- Radiological Assistance Team.
- Corporate HAZMAT Team.
- Senior management representatives.

- Security.

Emergency Response Plan – An [emergency plan](#) that provides procedures for Members of the Workforce engaged in hazardous operations and emergency response. An emergency response plan includes: pre-emergency planning, roles for Members of the Workforce, and emergency recognition. See Chapter 15, “Emergency Preparedness and Management,” for additional information.

Evacuation/emergency plan – A document describing the process designed to respond to and mitigate emergencies. A plan may range from a placard(s) or sign(s) listing evacuation routes and exits (in facilities that are adequately addressed by corporate processes) to a formal, detailed plan (in facilities requiring more rigor).

There are two types of emergency plans:

- [Emergency action plan](#)
- [Emergency response plan](#)

Elements of an emergency plan include a description of site/facility/operations, the hazards, hazard controls, emergency response placards, potential consequences, postulated accidents, and actions to be taken by emergency responders in the event of an emergency.

Employee – All persons employed directly by Sandia Corporation, whether on a full- or part-time, regular, or temporary basis.


Energy source – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Energy source isolating device – A mechanical or electrical device that removes a source of energy to the equipment or prevents the release of energy within a piece of equipment. The following are examples of energy source isolating devices:

- Manually operated circuit breakers
- Electrical disconnect switches

- Globe and ball valves
- Flange blanks
- Blocks of wood to support elevated portions of equipment from falling down

The following are **not** energy source isolating devices because they operate control circuits and do not provide lockable isolation of the main source of energy to the equipment:

- 
- Interlock switches
 - Push buttons
 - Selector switches
 - Motor starter circuits
 - Equipment control circuits that operate internal relays to disconnect power
 - Key switches that operate internal relays to disconnect electrical power

Engineering control – Physical or engineered features that provide passive or active protection to personnel or the environment, such as modifying, containing, or restricting access to a hazard without human intervention.

Engineering controls for bloodborne pathogens – Controls such as sharps disposal containers and self-sheathing needles that isolate or remove the [bloodborne pathogens hazard from the workplace](#).

Enhanced Property Management System (EPMS) – A database of numbered property or equipment with a value of \$5,000 or more and sensitive property (items attractive for personal use and easily converted to cash).

Entrant – An appropriately trained individual who enters a confined space.

Entry – The act by which a person intentionally passes through an opening into a confined space. The [entrant](#) is considered to have entered as soon as any part of the body breaks the plane of an opening into the space.

Entry permit – The written or printed document established by SNL, the content of which is based on hazard identification and evaluation for a confined space or group of spaces with similar hazards. It is the method by which a supervisor authorizes [SNL personnel](#) to enter the permit required confined space (PRCS). The entry permit:

- Defines the conditions under which the PRCS may be entered.
- States the reason(s) for entering the space and the anticipated hazards of the entry.
- Lists the eligible [attendants](#), [entrants](#), and the [supervisor authorizing entry \(SAE\)](#).
- Establishes the length of time for which the permit may remain valid.

Entry supervisor – See "[supervisor authorizing entry \(SAE\)](#)."

Environmental Assessment (EA) – A concise public document, for which a federal agency is responsible, that provides sufficient evidence and analysis for determining whether to prepare either a finding of no significant impact (FONSI) or an environmental impact statement (EIS).

Environmental checklist/action description memorandum – Memorandum that communicates the "first order" environmental considerations to be included in the decision-making process and serves as a planning tool for evaluating potential environmental impacts prior to committing SNL to a course of action. It is also used to determine if an environmental assessment or an environmental impact statement (EIS) is necessary.

Environmental Impact Statement (EIS) – A detailed public document, for which a federal agency is responsible, that provides analysis of the expected impacts on the human environment of a proposed action and alternatives to the proposed action.

Environmental restoration (ER) site – Any location listed on the environmental restoration (ER) site list that has been identified as an area that is (or may be) contaminated-either on or beneath the land surface-as a result of SNL operations. Contaminants may be chemicals, radioactive material, or both.

Environmentally nonessential burning – Environmentally nonessential burning is the burning of any unwanted material or assembly or collection of combustible material that could otherwise reasonably be altered, destroyed, reduced, or removed to a suitable disposal site without the potential to cause environmental harm or damage in situ or en route.

Environmentally poor burning substances – Substances that include, but are not limited to, leaves, grass clippings, green plants, refuse, paper, rubbish, books, magazines, fiberboard, packaging, rags, fabrics, animal waste, waste oil, liquid or gelatinous hydrocarbons, tar, paints, solvents, chemically soaked wood, plastic or rubber, office records, sensitive or classified waste, and interiors of wrecked vehicle bodies, and other material that is difficult to burn without producing vast amounts of noxious and toxic fumes or dense smoke.

EOC – Emergency Operations Center

EPA – Environmental Protection Agency

Equipment – Includes, but is **not** limited to, test apparatus, test facilities, and electrical and mechanical components of utilities, buildings, and laboratories.

Equipment important to safety – Equipment with a functional capability to affect safety either directly or indirectly. This includes safety class and [safety significant structures, systems, and components \(SSCs\)](#), and other systems that perform an important defense-in-depth function; equipment relied on for safety shutdowns; and in some cases, process equipment. These considerations apply to both workers and the public.

Equivalent – A component or part is considered to be equivalent if it meets any of the following criteria:



- Physically identical to the original component or part
 - Specifically meets all design specifications and quality requirements of the original component or part
 - Has been demonstrated and documented to meet all functional requirements

Equivalent source – A source that provides training considered equivalent to the training offered at SNL.

ER – Environmental restoration

Ergonomics – According to the U.S. Department of Labor, ergonomics is the study of the design of the requirements of work in relation to the physical and psychological capabilities and limitations of people. The discipline seeks to adapt the job and workplace to the worker rather than the person to the job. Many aspects of the physical work environment, including workstation layout, work processes, tool design, work schedule, and facilities design, play a role in personnel productivity and creativity and can have an impact on work-related musculoskeletal injuries and illnesses.

ES&H function managers – Managers who are accountable for developing ES&H program elements for their functional area, based on external requirements and organizational needs and agreement.

ES&H functional manager/program owner– Responsibility for each of the functional areas within the ES&H Program has been delegated to ES&H function managers, who are accountable for developing plans to communicate ES&H requirements and SNL's ES&H policy.

ES&H section chief at SNL/NM – At SNL/NM, the ES&H section chief is the person who

represents environment, safety, and health in the Incident Command System (ICS), the emergency response organization at SNL/NM. The ES&H section chief may be asked to conduct initial investigations to assess events that may have ES&H impacts that are reported through the hotline.

ES&H standard operating procedure (ES&H SOP) – A document used to help plan the conduct of hazardous activities by describing the activity, the associated hazards, and the mitigation of those hazards. ES&H SOPs are intended for use by one or more organizations.

ES&H training compliance standards – Standards that ensure quality of instructional design, auditability, and instructor delivery. The extent to which the training must meet these standards depends on to what degree the training qualifies an individual to perform potentially hazardous operations. The standards include everything from job/task analysis requirements to instructional design process and records maintenance requirements. (These standards are meant to apply to Corporate Education Development and Training (CEDT), compliance-oriented courses, but may be used as guidance for all course development.)

Etiologic agent – A viable microorganism or its toxin which causes, or may cause, human disease.

Evacuation/emergency plan – A document describing the process designed to respond to and mitigate emergencies. The plan may range from a placard(s) or sign(s) listing evacuation routes and exits (in facilities that are adequately addressed by corporate processes) to a formal, detailed plan (in facilities requiring more rigor). Elements of an emergency plan include a description of site/facility/operations, the hazards, hazard controls, emergency response placards, potential consequences, postulated accidents, and actions to be taken by emergency responders in the event of an emergency.

Evacuation team captain – Person in charge of organizing, maintaining, and training (with the assistance of fire protection engineering personnel) a building evacuation team. The evacuation team captain assumes the responsibility for the safe evacuation of all building occupants from the building due to a fire or other emergency. The evacuation team captain remains in charge until properly relieved by the incident commander or fire department personnel.

Event – An incident, situation, or condition that has or may have an undesirable effect on the safety or health of people, or on the environment.

Evidence Package – A package of documentation demonstrating completion of an action item in a Corrective Action Plan, or completion of all items in a Corrective Action Plan.

EVP – Executive vice president

EWDR – Explosive waste disposal request

Excavation – Man-made cavity or depression in the earth's surface formed by earth removal, which produces unsupported sides or faces.

Exception – Release of an individual from portions of a training program through prior education, experience, training, and/or testing.

Exercise – Any scenario that simulates an actual incident to which a security force would respond.

Existing chemical – Chemical substance included on the TSCA inventory list.

Existing NEPA Document – An existing, final, NEPA document and associated federal agency NEPA determination, that may be reviewed and cited, if appropriate, as providing NEPA coverage for a particular task or activity. NEPA documents and determinations include (1) NEPA checklists (formerly titled [ECL/ADM](#)) and associated categorical exclusion determination, (2) environmental assessment (EA) and associated finding of no significant impact (FONSI), or (3) environmental impact statement (EIS) and associated record of decision (ROD).

Exit way – That portion of a means of egress that is separated from all other spaces of a building or structure by construction or equipment as required in 5-1.3.2.1 in NFPA 101, *Life Safety Code*, to provide a protected way of travel to the exit discharge. Exits include exterior exit doors, exit passageways, horizontal exits, separated exit stairs, and separated exit ramps.

Exclusive use – Exclusive use, which is also referred to as "sole use" or "full load," is the sole use of a conveyance by a single consignor for which all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee.


Explosive – Any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classified under the provisions of 49 CFR Part 173.

Explosive (DOT) – Any substance, article, or device that is designed to function by explosion (extremely rapid release of gas and heat) or that, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless otherwise classed under the provisions of the DOT hazardous material regulations.

Explosive [packaging and transportation definition]– Any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classified under the provisions of [49 CFR Part 173](#), *Shippers—General Requirements for Shipments and*


Packagings.

Explosive waste – Any explosive substance, article, or explosive-contaminated item that cannot be used for its intended purpose and does not have a legitimate investigative or research use. Examples include:

- 
- Unstable explosive substances or articles
 - Wipes, filters, or debris contaminated with explosives
 - Scraps, cuttings, chips, fines, etc. from plastic, composite, or sheet explosives
 - Explosives dissolved in solvents
 - Damaged or misfired explosive articles
 - Small quantities of bulk explosives, pyrotechnics, and propellants for which there are no known reapplication uses

Any of the above examples that have an investigative or research use are not waste until the owner determines that there is no further legitimate need or use for them.


Export – To send a chemical substance or mixture or article containing a chemical substance or mixture out of the customs territory of the U.S.



Exposed (electrical definition) – A worker's contact with a chemical, physical or biological agent. Exposures can occur via several pathways, including inhalation, ingestion, injection, skin contact, and whole body radiation (nonionizing sources).


Exposed (industrial hygiene definition) – A worker's contact with a chemical, physical or biological agent. Exposures can occur via several pathways, including inhalation, ingestion, injection, skin contact, and whole body radiation (nonionizing sources).


Extremely Hazardous Waste (California) – A waste, or a material, is extremely hazardous if it exhibits the following characteristics:

- 
- Acute oral LD50 less than or equal to 50 milligrams per kilogram.
 - Acute dermal LD50 less than or equal to 43 milligrams per kilogram.
 - Acute inhalation LC50 less than or equal to 100 parts per million as a gas or vapor.
 - Contains any of the substances listed in ATTACHMENT A Toxicity characteristics at a single or combined concentration equal to or exceeding 0.1 percent by weight.

- Has been shown through experience or testing that human exposure to the waste or material may likely result in death, disabling personal injury or serious illness because of the carcinogenicity, high acute or chronic toxicity, bioaccumulative properties, or persistence in the environment of the waste or material.
- It is water-reactive.

Eye and face protection devices – Representatives of commonly available types include the following:

- 
- **Spectacles** - Protective devices (such as, safety glasses) intended to shield the wearer's eyes from a variety of hazards.
 - **Goggles** - Primary protective devices intended to fit the face immediately surrounding the eyes in order to shield the eyes from a variety hazards. Goggles are commonly available in two styles: eyecup, to cover the eye sockets completely; and cover, which may be worn over spectacles.
 - **Welding helmets** - Protective devices intended to shield the eyes and face from optical radiation and impact. Welding helmets are secondary protectors and are used only in conjunction with primary protectors.
 - **Faceshields** - Protective devices generally intended to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards. Faceshields are secondary protectors and are used only with primary protectors.



Eye hazards – Chemicals which affect the eye or visual capacity.

F

FAA – See definition of "[Federal Aviation Administration \(FAA\)](#)."

Facilities asbestos – Asbestos or asbestos-containing material that is part of a building such as any of the following:

- Ceiling tile
- Pipe insulation
- Floor tile

- 
- Roofing or siding material

See also "[asbestos](#)," "[friable asbestos](#)," and "[nonfacilities asbestos](#)."

Facility – Land, buildings, and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein, including site development features outside the plant, such as landscaping, roads, walks, parking areas, outside lighting and communication systems, central utility plants, utilities supply and distribution systems, and other physical plant features. These include any of the DOE-owned, -leased, or -controlled facilities, and they may or may not be furnished to a contractor under a contract with DOE.”

Facility (Process Safety Management Standard) – The buildings, containers, or equipment that contain a process.

Facility electrical distribution system – Includes transformers, panel boards, receptacles (wall outlets), switches, and other pieces of equipment that are permanently wired into the facility electrical distribution system and that are not specifically identified as "user" equipment.

Facility manager – An SNL employee or contractor (if allowed by the contract) who is assigned the responsibility of managing the day-to-day operations of a specific facility.

Facility manager/designee (with respect to occurrence reporting and related processes) – An SNL facility manager (with respect to occurrence reporting and related processes) is identified as the vice president or the person who has responsibility over a division. Their responsibilities may be delegated to a designee who is a Center director or below.

Fall-arrest system (personal) – An assembly of components and subsystems used to arrest a person in a fall from a working height. This system includes a full body harness and a means of connecting the harness to an anchorage or anchorage connector, which may consist of a lanyard, energy absorber, fall arrester, lifeline, or combination of these.

fcc – Face-centered cubic crystal structure. Many fcc-structured metals that are ductile at room temperature remain ductile at cryogenic temperatures.

Federal Aviation Administration (FAA) – The agency within the DOT that governs the regulation, operation, and certification of all commercial and private aircraft and aircraft operators.

Feral – Wild, untamed, or undomesticated.

Filtering facepiece – (also referred to as a "dust mask") means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Final report (with respect to the startup and restart process at SNL) – A formal report that includes the following:



- Review of activities
- Conclusions reached and their bases
- Confirmation of any prestart findings that were resolved
- Open prestart and post-start findings
- Observations and concerns that do not impact startup and restart.
- Explanations of any deviations
- A lessons learned section.

Finding – A statement of fact based on objective evidence documenting an act or condition that does not meet requirements, policies, or procedures required by law, a regulatory agency, DOE, Sandia CPR, or a formally-invoked, site-specific, standard.

Note: Org. 12870 refers to findings as "issues" in their audit reports.

Finding [firearm safety definition] – A factually-supported and clear violation of a Sandia requirement or a DOE order.

Finding of No Significant Impact (FONSI) – A concise document by a federal agency, based on analysis in an EA, that presents the reasons that an action is not expected to have a significant impact upon the human environment and therefore will not be the subject of an environmental impact statement (EIS).

Finding (with respect to the startup and restart process at SNL) – A departure from a specified requirement that is a deficiency in characteristic, documentation, procedure, personnel training and qualification, or design that renders the item or activity unacceptable or indeterminate. The severity and potential consequences should be addressed in describing the deficient condition. There are two types of findings: prestart and post-start.

Fine work – Detail work requiring manual dexterity that excludes the use of hand protection, such as when working with electronics, picking up small objects, or buttoning or zipping clothing.

Firearm – Any weapon (including a starter gun) which will or is designed to or may readily be converted to expel a projectile by the action of an explosive or other propellant. This includes the following:

- A shotgun having a barrel or barrels of less than 18 inches in length or a weapon made

from a shotgun if such weapon as modified has an overall length of less than 26 inches or a barrel or barrels of less than 18 inches in length.

- A rifle having a barrel or barrels of less than 16 inches in length or a weapon made from a rifle if such weapon as modified has an overall length of less than 26 inches or a barrel or barrels of less than 16 inches in length.
- A machine gun.
- Any firearm muffler or firearm silencer.
- Any destructive device such as:
 - Any explosive incendiary, or poison gas.
 - Bomb.
 - Grenade.
 - Rocket having a propellant charge of more than four ounces.
 - Missile having an explosive or incendiary charge of more than one-quarter ounce.
 - Mine.
 - Device similar to any of the devices described above.
- Any type of weapon (other than a shotgun or a shotgun shell which is generally recognized as particularly suitable for sporting purposes) by whatever name known which will, or which may be readily converted to, expel a projectile by the action of an explosive or other propellant at a muzzle velocity of greater than 500 feet per second, and which has any barrel with a bore of more than one-half inch in diameter.
- Any combination of parts either designed or intended for use in converting any device into any destructive device described above and from which a destructive device may be readily assembled.

Firearms custodian – An appropriately trained Member of the Workforce authorized by management as a [firearms-authorized personnel](#) that has received additional firearm custodian training specific to the responsibilities as a firearms custodian as outlined in CPR400.1.1.40/ GN470104, *Firearms Management*.

Firearms-authorized personnel (FAP) – Trained Members of the Workforce who are:

1. Able to demonstrate basic knowledge and skill at a level that ensures the safe use of firearms and handling of munitions.

2. Approved by management.

Firearm-like items – An item that:

- Resembles a [firearm](#), but cannot fire, eject, expel, or propel a projectile. This does not include any firearm that has been potted (i.e., filled with an epoxy-like substance to disable its firing capability).
- An item that can fire, eject, or propel a projectile less than or equal to one-half inch in diameter at a muzzle velocity of less than 500 feet per second. This includes toys, air guns, pellet guns, BB guns, etc. This does not include firearms that have been converted or modified in such a manner to hinder its usability, which could be converted back into a usable firearm.

Note: These items are considered hazards and should be used with care.

Fire alarm system – A system that automatically detects a fire condition and actuates fire alarm-signaling devices.

Fire suppression system – An approved system of devices and equipment that automatically discharges an approved fire-extinguishing agent onto or in the area of a fire, in order to control or extinguish the fire. Fire suppression systems can include automatic sprinkler systems and their appurtenances and gaseous extinguishing systems and their appurtenances.

Fire watcher – Person designated to watch another person while they perform work involving a fire hazard (e.g., welding) to ensure that the person performing the work does not catch fire or cause a fire to start.

Fissile material – Materials which have nuclides that can undergo fission to create a neutron chain reaction and thereby present NCS concerns. At SNL, U-235 and Pu-239 are the fissile nuclides of primary NCS concern. The [NCS Program](#) document provides a more detailed list of nuclides that may be NCS concerns. Many nuclides on this list are more properly called [fissionable](#), but the term “fissile” is used because fissile nuclides are the predominate NCS concerns. This choice to use the term “fissile”, rather than “fissionable” is consistent with the approach used in the ANSI/ANS-8.19-1984 standard.

Operations involving fissile materials are controlled under the [NCS Program](#) and persons needing assistance with NCS concerns should contact the [Criticality Safety Officer](#).

Fissile material operation (FMO) – Any facility, system, or activity that involves or potentially involves [fissile material](#) inventories exceeding the Threshold Limits defined in the [NCS Program](#). Activities which are FMOs include tests, transport, movement, receipt, loading,

unloading, inspection, handling, processing, collocating, disposal, or storage that involves fissile material.

Fissionable material – A broader term than “[fissile material](#)” that refers to all nuclides capable of fissioning, whether or not the fissionable material will support a chain reaction. Np-237 and Pu-238 are examples of fissionable materials that are non-fissile.”

Fit check – A positive or negative pressure fit check. Procedures call for a means of checking the fit of a respirator each time it is put on. This is normally done by cupping hands over the facepiece, exhalation valve, or cartridges of the respirator and exhaling or inhaling sharply as directed in the fitting instructions. A fit check does **not** qualify as a [fit test](#).

Fit test – A means of determining an individual's ability to obtain a good face fit with a particular respirator. A fit test must be satisfactorily completed before a respirator is worn in a contaminated area.

Fitness for duty – The determination that the physical and mental health of an individual is consistent with the requirements of assigned duties in a reliable and safe manner.

Flammable – A chemical that falls into one of the following categories:

- i. "Aerosol, flammable" means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame protection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;
- ii. "Gas, flammable" means:
 - a. A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13% by volume or less; or
 - b. A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit.
- iii. "Liquid, flammable" means any liquid having a flashpoint below 100 °F (37.8 °C), except any mixture having components with flashpoints of 100 °C or higher, the total of which make up 99% or more of the total volume of the mixture.
- iv. "Solid, flammable" means a solid, other than a blasting agent or explosive as defined in 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major

axis.

Flammable liquids – Liquids that vaporize at relatively low temperatures that can easily ignite at room temperatures, and that have a flash point lower than 100°F.

Flammable liquid or gas – A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air greater than 12% by volume, regardless of the lower flammable limit; or

- Any liquid having a flashpoint below 100 °F (37.8 °C), except any mixture having components with flashpoints of 100 °F (37.8 °C) or higher, the total of which make up 99% or more of the total volume of the mixture,

Except for:

- Hydrocarbon fuels used solely for workplace consumption as a fuel (e.g., propane used for comfort heating, gasoline for vehicle refueling), if such fuels are not a part of a process containing another highly hazardous chemical covered by the Process Safety Standard (29 CFR 1910.119);
- Flammable liquids stored in atmospheric tanks or transferred to other containers which are kept below their normal boiling point without benefit of chilling or refrigeration.

Floor or wall penetration – Digging, excavating, or trenching into building floors or walls to a depth greater than two inches.

Flowchart – A tool for showing the steps involved in a process. A flowchart consists of a diagram made up of boxes, diamonds and other shapes, connected by arrows. Each shape represents a step in the process, and the arrows indicate the order in which they occur.

FMO supervisors – [Members of the workforce](#) who are supervisors or managers directly involved in overseeing a [Fissile Material Operation](#).

FMO workers – [Members of the workforce](#) involved in [Fissile Material Operations](#), including facility managers or supervisors who are directly and immediately involved in overseeing the FMO.

FONSI – Finding of No Significant Impact.

Forklift – A high-lift self-loading truck, equipped with load carriage and forks, for transporting and tiering loads.

Forming, punching, and shearing machine – A power-driven metalworking machine, other

than a machine tool, which changes the shape of or cuts metal by means of tools, such as dies, rolls, or knives which are mounted on rams, plungers, or other moving parts.

Foreseeable emergency – See "[Emergency, foreseeable](#)".

Free liquid – Liquid which readily separates from the solid portion of a waste, as determined by the EPA Method No. 9095 Paint Filter Test and 22 CCR 66264.314(b).

Friable asbestos – Asbestos that is easily crumbled; the fibers are not well bound together and can readily become airborne. See also "[asbestos](#)," "[facilities asbestos](#)," and "[nonfacilities asbestos](#)."

Frostbite – Injury to skin and subcutaneous tissues, and in severe cases also to deeper tissues, from exposure to extreme cold.

FSAR – Final Safety Analysis Report (see [Safety Analysis Report](#)).

Functional repair – Repairs that may have an effect on the safe operation or reliability of the firearm.

Fugitive dust – Organic or inorganic particulate matter in quantities of and of a duration that may, with reasonable likelihood, injure human health, animal health, or plant life; reduce safe visibility, cause property damage, or degrade visibility.

Note: Water vapor, steam, or particulate matter emissions emanating from a duct or stack of process equipment are not considered fugitive dust.

Fugitive dust control permit – A permit approved by the City of Albuquerque's Environmental Health Department that contains an approved [fugitive dust control plan](#) that allows the beginning of active operations when the permit is signed by an authorized department representative.

Fugitive dust control plan – The portion of the permit application that details any reasonably available control measures and other effective measures the permit applicant commits to use to reduce the quantity of [fugitive dust](#) and transported material leaving the property or area under the control of the permittee in order to prevent a violation of the national ambient air quality standards (NAAQS), including contingency fugitive dust control measures that are an applicable requirement of any [fugitive dust control permit](#).



General public – Includes, but is not limited to, vendors, contractors, SNL reapplication and recycling; or any where Sandia is not in physical possession of equipment or other items located on Sandia-controlled premises.

General-use facilities – Facilities containing hazards routinely encountered and accepted by the public, such as automobile repair shops, university laboratories, gasoline stations, and paint and hardware stores. Standard office facilities generally pose lower hazard levels than those presented by general-use facilities and are not classified as general-use facilities except under special circumstances.

Generator – Any employee, onsite contractor, or visitor who generates, manages, stores, or requests disposal of a [hazardous waste](#). Generators and their organizations are responsible for the hazardous waste they generate and any byproducts (such as waste spill cleanup material) until the waste is removed to the Hazardous Waste Management Facility (HWMF).

GFCI – Ground fault circuit interrupter

Goods – Tangible items, such as reports, equipment, raw material, components, software, and chemicals.


Graded approach – Term used to refer to matching the reliability of controls to the degree of protection that is needed.

Graded approach (ES&H Training) – A process by which the level of analysis, documentation, and actions necessary to comply with a requirement are commensurate with:

- The relative importance to safety, safeguards, and security
- The magnitude of any hazard involved
- The life cycle stage of a facility
 - The programmatic mission of a facility
 - The particular characteristics of a facility
 - Any other relevant factor.

Ground fault circuit interrupter (GFCI) – A device that functions to protect personnel from electrical shock hazards; unlike circuit breakers and fuses, which provide overcurrent protection for equipment and wiring, but do not provide protection for personnel.

Group lockout/tagout – Where several workers are servicing equipment, each worker



attaches a lock and tag on each energy source isolating device. This is accomplished by placing the locks on a multiple-lock hasp or on a [lockbox](#) that contains the keys for locks attached to [energy source isolating devices](#).

GSA – Government Services Administration

Guard – A barrier that prevents an individual's clothing, body, hands, and/or fingers from entering into the point of operation.

Guillotine shear – A machine equipped with a moving blade operated vertically and used to shear materials. The term shall not include other types of shearing machines, using a different form of shearing action, such as alligator shears or circular shears.

H

H₂ – Hydrogen (gas phase)




HA – Hazards Analysis

Halon – Any of the [Class I](#), Group II substances. This group consists of three halogenated hydrocarbons known as Halon 1211, Halon 1301, and Halon 2402, and all isomers of these chemicals.

Halon-containing equipment – Equipment used to store, transfer, and/or disperse [halon](#).

Hand carry – With respect to the packaging and transportation of hazardous material, hand carrying is the physical relocation (with or without a vehicle) of an item by an individual whose principal job (or training) is not the onsite transportation of property or material.

Hand-feed tools – Any hand-held tool designed for placing, removing, or controlling material or parts to be processed within or from the point of operation.




Handling (RCRA) – The transporting or transferring from one place to another, pumping, processing, accumulation, or packaging of waste.

Hantavirus Pulmonary Syndrome – A severe respiratory illness caused by a hantavirus that is believed to be transmitted via aerosols generated from rodent urine, droppings, and saliva.

HAP – Hazardous air pollutant

HASP – Health and safety plan


Hazard – A source of danger (e.g., energy, material, or operations) with the potential to cause illness, injury, or death to a person, or damage to a facility or to the environment (without regard to the likelihood or credibility of accident scenarios or consequence mitigation).



Hazard Assessment Document (HAD) – An analysis of the possible consequences to people and the environment from the release of chemicals or radionuclides from a facility, including the development of actions to be taken to minimize the consequences.


Hazard category (HC) – The consequences of unmitigated releases of radioactive or hazardous material are evaluated by site processes as required by [DOE 5480.23](#), *Nuclear Safety Analysis Reports*, and [DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, and classified by the following hazard categories for nuclear facilities ([DOE 425.1A](#), *Startup and Restart of Nuclear Facilities*):

- HC 1: The hazard analysis shows the potential for significant offsite consequences.
- HC 2: The hazard analysis shows the potential for significant onsite consequences.
- HC 3: The hazard analysis shows the potential for significant localized consequences only.



Hazard class – The category of hazard assigned to a hazardous material under the definition criteria of 49 CFR, Part 173 and the provisions of the hazardous material table of 49 CFR, Part 172.101. A material may meet the defining criteria for more than one hazard class. Material that meets the definition of more than one hazard class or division shall be assigned to one principal hazard class in accordance with the provisions of 49 CFR, Part 173.2a.

Hazard class (with respect to the startup and restart process at SNL) – The consequences of unmitigated releases of hazardous nonnuclear material are classified according to three levels. This presumes any radioactive material is below the category 3 threshold as defined in [DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*. These hazard classifications are used to determine approval authorities for nonnuclear facilities:

- 
- High-hazard facilities: Facilities with the potential for onsite or offsite impacts to a large number of persons or for major impacts to the environment.
 - Moderate-hazard facilities: Facilities with considerable potential for onsite impacts to people or the environment, but, at most, only minor offsite impacts.
 - Low-hazard facilities: Facilities with the potential for minor onsite and negligible offsite impacts to people or the environment.

Hazard controls – Measures to eliminate, limit, or mitigate hazards to workers, the public, or the environment, including:

- Physical, design, structural, and engineering features
- Safety structures, systems, and components
- Safety management programs
- Technical safety requirements
- Other controls necessary to provide adequate protection from hazards.

Hazard, health – A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed personnel. The term health hazard includes chemicals which are:

- [Carcinogens](#).
- [Toxic](#) or [highly toxic](#) agents.
- [Reproductive toxins](#).
- [Irritants](#).
- [Corrosives](#).
- [Sensitizers](#).
- [Hepatotoxins](#).
- [Nephrotoxins](#).
- [Neurotoxins](#).
- [Agents which act on the blood or hematopoietic system](#).
- [Agents which damage the lungs, eyes, or mucous membranes](#).

This definition also includes stress due to temperature extremes.

Hazard, physical – See [physical hazard](#).

Hazard [USQ process] – A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to a person, or damage to a facility or to the environment (without regard to the likelihood or credibility of accident scenarios or consequence mitigation).

Hazardous air pollutant (HAP) – An air contaminant, which is listed as a hazardous air pollutant pursuant to Section 112 of the [Clean Air Act \(CAA\)](#).

Hazardous atmosphere – An atmosphere that exposes individuals to a risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

- A flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL)
- An airborne combustible dust at a concentration that meets or exceeds its LFL. This concentration may be approximated as a condition that obscures vision at a distance of 5 feet (1.52 m) or less.
- An atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
- An atmospheric concentration in excess of the permissible exposure limit (PEL) or threshold limit values (TLVs), whichever is lower (including short-term exposure limit [STEL] and ceiling concentrations), as identified in or the American Conference of Governmental Industrial Hygienists (ACGIH) TLV booklet.

Note: In the absence of a PEL or TLV for a contaminant that may be present, consult other sources such as a material safety data sheet or SNL industrial hygiene (IH) personnel.

- Any atmospheric condition recognized as immediately dangerous to life or health (IDLH).

Hazardous chemical – A chemical which presents a [physical hazard](#) or [health hazard](#).

Hazardous debris – means debris that contains a hazardous waste listed in subpart D of part 261 of this chapter, or that exhibits a characteristic of hazardous waste identified in subpart C of part 261 of this chapter. Any deliberate mixing of prohibited hazardous waste with debris that changes its treatment classification (i.e., from waste to hazardous debris) is not allowed under the dilution prohibition in Sec. 268.3.

Hazardous material [packaging and transportation definition] – Any substance or material in a quantity and form that may pose an unreasonable risk to health and safety or to property when handled or moved. Unless specified, this includes all hazardous material and substances including, but not limited to, chemicals, [explosives](#), [radioactive material](#) and biological agents as

regulated by the Department of Transportation (DOT), the Environmental Protection Agency (EPA), and/or the Centers for Disease Control and Prevention (CDC).

Hazardous material (with respect to packaging and transportation) – (1) A substance or material, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. The term includes hazardous substances, hazardous waste, marine pollutants, and elevated temperature material as defined in this section, material designated as hazardous under the provisions of 49 CFR 172.101, and material that meets the defining criteria for hazard classes and divisions in 49 CFR 173. (2) Any substance or material in a quantity and form that may pose an unreasonable risk to health and safety or to property when handled or moved. Unless specified, this includes all hazardous material, hazardous substances, and radioactive material as defined in DOT and Environmental Protection Agency (EPA) regulations.

Hazardous material (with respect to reapplication) – A hazardous or potentially hazardous item is any material or item that is itself, or may have contained or been exposed to, any substance meeting one or more of the following criteria:

- Radioactive material above exempt quantities or contamination above release limits
- Biological agents
- Petroleum products or other oils, greases, or fuels
- Explosive, pyrotechnic, or pyrophoric agents
- Chemicals (liquid or dry)
- Items that are electrically chargeable, that emit, or that may have been exposed to ionizing radiation
- Pressurized containers
- Anything containing friable (easily crumbled) asbestos or propellants
- Modified or broken items that may be unsafe

Hazardous Material (HAZMAT) Response Team – An organized group of employees, designated by the employer, who are expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT Team is not a fire brigade; however, it may be a separate component of a fire brigade or fire department.



Hazardous substance – Any substance designated or listed as follows, exposure to which results or may result in adverse effects on the health or safety of employees:

- Any substance defined under section 101(14) of CERCLA.
- Any biologic agent and other disease causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring.
- Any substance listed by the DOT as hazardous material under 49 CFR 172.101.
- Hazardous waste (see definition of ["hazardous waste"](#)).



Hazardous waste – Waste that meets any of the following conditions:

- On analysis, exhibits any of the characteristics of a hazardous waste as defined in 40 CFR 261 Subpart C.
- Has been named as a hazardous waste and is listed as such in 40 CFR 261 Subpart D.
- A mixture containing a listed hazardous waste and a nonhazardous solid waste.
- A waste derived from the treatment, storage, or disposal of a listed hazardous waste.
- Is **not** excluded from regulation as a hazardous waste.
- Defined as hazardous waste by specific state regulations.

Hazardous waste (California) – Defined by the State of California (22 CCR 66261) as discarded material of any form (liquid, solid or gaseous) posing a substantial potential human health threat meeting any of the following criteria:

- Listed as hazardous waste by EPA in 40 CFR 261 or by the State of California in 22 CCR Division 4.5.
- Exhibits one or more hazardous waste characteristics: Ignitable, Corrosive, Reactive, or Toxic, as defined by EPA or the State of California.
- Known to be chemically hazardous and/or the material or processes used to generate it are chemically hazardous.
- Hazardous materials discarded by burning, recycling, treatment, or application to the

land.

- Mislabeled or inadequately labeled hazardous materials not promptly relabeled.
- Hazardous materials in deteriorated or damaged containers and not promptly repackaged.

Hazardous Waste Facility – Facility used for the permitted treatment or storage of hazardous waste.

Hazardous waste site – Any facility or location at which hazardous waste operations take place.

Hazards assessment document – The hazards assessment document is the basis for developing the emergency response plan for a facility or site. It considers accident initiators such as sabotage or terrorist attacks, which are not considered by the safety analysis process. Hazards assessment documents are the bases for emergency plans developed by the Integrated Risk Management Department (7523) or the Health Services Department (8527).

HAZMAT employee – a person who is employed by a HAZMAT employer (e.g., Sandia National Laboratories) and who in the course of employment directly affects hazardous materials transportation safety. At SNL, this term includes:

- An operator of a motor vehicle that transports hazardous materials in commerce.
- An individual who:
 - Loads, unloads, or handles hazardous materials.
 - Manufactures, tests, reconditions, repairs, modifies, marks, or otherwise represents containers, drums, or packagings as qualified for use in the transportation of hazardous material.
 - Prepares hazardous material for transportation.
 - Is responsible for safety of transporting hazardous material.

HAZMAT-trained individual [packaging and transportation definition] – A member of the workforce whose work involves:

- Loading, unloading, or handling [hazardous material](#).
- Preparing hazardous material for transportation.
- Preparing documentation in support of hazardous material transportation.

- Being responsible for the safety of hazardous material being transported.

This individual is in one of the following employment categories:

- Employed by a [HAZMAT-trained packaging and transportation \(P&T\) organization](#) (e.g., Shipping & Packaging Services, [Department 10264](#)), and, in the course of employment, directly affects hazardous materials transportation safety ([49 CFR 171.8](#)). This individual must be current on all required PKX courses and any other courses as defined by his/her management.
- Employed by a non-HAZMAT-trained P&T organization (e.g., W78 Systems Engineering, [Department 2112](#)), and, in the course of employment, directly affects hazardous materials for [onsite](#), transfer. This individual must be current on PKX 100, “General Awareness,” and any additional courses determined and documented by the HAZMAT Training Lead as being required based on the general characteristics of the material to be transported onsite.

HAZMAT-trained packaging and transportation (P&T) organization [packaging and transportation definition] – A Sandia organization (e.g., department) whose primary function includes the packaging, loading, and [onsite](#), transport of [hazardous material](#) or substances, including waste.

HAZWOPER – Hazardous waste operations and emergency response.

HBV – Hepatitis B virus

He – Helium (gas phase)

Health hazard – See [hazard, health](#).

Hearing protection – Personal Protective Equipment (PPE) that is designed to provide attenuation of high noise or ultrasound levels, such as earplugs or ear muffs.

Heat strain – The body’s response to heat stress.

Heat stress – The combination of environmental and physical work factors that constitute the total heat load imposed on the body. Heat stress may give rise to a number of heat induced illnesses (e.g., heat cramps, heat distress, heat exhaustion, heat syncope, heat stroke).

Heat stressor – A stimulus that has the potential to increase the [core body temperature](#) of an individual.

Heavy earth moving equipment – Term used to refer to the following types of equipment:

- Front-end loaders (2 ½-yard or larger bucket capacity)
- Motorgraders
- Bulldozers
- Dump trucks (10-yard or larger capacity)

Hepatotoxins – Chemicals which produce liver damage.

High contamination area – Any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed 100 times the removable surface contamination values specified in [Appendix D](#) of [MN471016](#), *Radiological Protection Procedures Manual*.

High-efficiency particulate air (HEPA) filter – Is a filter capable of trapping and retaining 0.3 micrometer monodispersed particulates.

High-hazard industrial operations – Operations with potential for significant offsite impacts to large numbers of persons or major impacts to the environment.

High-injury-potential operations [Section 4A definition] – Operations that include those situations which expose Members of the Workforce to risks where, **if** a system failure occurs, there is a likelihood of serious injury.

High-injury-potential operations – Operations that include those situations which expose SNL personnel to risks where, **if** a system failure occurs, there is a likelihood of serious injury.

High injury potential operation – Activities where there is a likelihood of serious injury if a system failure occurs, including activities involving explosives, radiation (ionizing and nonionizing), hazardous voltages (exceeding 300 V, 10 mA/AC, 60 mA/DC), steam, high energy pressure system, dangerous chemicals, underwater diving, confined spaces, and working at a remote site.

High-level radioactive waste – The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid, that contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

High-noise level – Noise that is greater than the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for noise. A high-noise level can

be described as a sound level that would require you to raise your voice in order to be heard by another person three feet away.

ACGIH TLVs for Noise Time Period		
Time Period	Duration per Day	Sound Level dB(A-Weighted)
Hours	24	80
	16	82
	8	85
	4	88
	2	91
	1	94
Minutes	30	97
	15	100
	7.50	103
	3.75	106
	1.88	109
	0.94	112
Seconds	28.12	115
	14.06	118
	7.03	121
	3.52	124
	1.76	127
	0.88	130
	0.44	133
	0.22	136
	0.11	139

No exposure to noise in excess of a peak C-weighted level of 140 dB.

High radiation area – Any area, accessible to individuals, in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 0.1 rem (0.001 sievert) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

High ultrasound level – Ultrasound that is greater than the American Conference of

Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) listed in the table below. Ultrasound is high frequency sound that ranges as low as 10 kHz and as high as 100 kHz and is inaudible to the human ear, although audible subharmonics from ultrasonic sources are detectable. The upper frequency of audibility of the human ear is approximately 15 to 20 kHz, however, this limit is not fixed, and some individuals may have higher or lower limits. Examples of ultrasonic devices include ultrasonic welders, cleaners and turbo-pumps.

ACGIH TLVs for Ultrasound		
Mid-Frequency of Third-Octave Band (kHz)	Ceiling Values (dB)	8-Hour TWA (dB)
10	105	88
12.5	105	89
16	105	92
20	105	94
25	110	-
31.5	115	-
40	115	-
50	115	-
63	115	-
80	115	-
100	115	-

Highly hazardous chemical – A substance possessing toxic, reactive, flammable, or explosive properties and specified by paragraph (a)(1) of [29 CFR 1910.119](#).

Highly toxic – A chemical falling within any of the following categories:

- A chemical that has a median lethal dose (LD50) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
- A chemical that has a median lethal dose (LD50) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- A chemical that has a median lethal concentration (LC50) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within

one hour) to albino rats weighing between 200 and 300 grams each.

Historic property (or cultural resource) – Defined in the *National Historic Preservation Act* as any archaeological, prehistoric, or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. Usually, a site, structure, or object must be over 50 years old to be considered potentially significant, but younger structures may also be significant.

Historic properties at SNL locations include archaeological sites and artifacts, such as pottery, stone tools, and implements. Some SNL locations contain Native American grave sites. Other historic properties at SNL locations include historic buildings and remains, such as:

- Old mining camps and shafts.
- Water dams and diversions.
- Farming or herding remains, such as corrals and sheep pens.

Structures, buildings, and artifacts associated with the World War II and Cold War eras also have the potential to be considered historically significant.

HIV – Human immunodeficiency virus

HOC – Hazardous organic compound

Hoist – An apparatus for raising and lowering into position which may or may not move on a rail and is not mounted on an overhead crane.

Hood – A respiratory inlet covering that completely covers the head and neck and may cover portions of the shoulders.

Hood face velocity – The velocity in feet per minute (fpm) of air movement through the face of the hood. This is also defined as the volume flow rate of the hood divided by the cross-sectional area of the hood face.

Hostile environment – An environment where standard operating, maintenance, inspection, or test procedures cannot be followed as a result of radiation or radioactive contamination, toxic/hazardous chemicals or gases, or temperature extremes.

Hot particle – Fuel, activated corrosion product, or other particles of small size that have a high, specific activity as a result of nuclear fission or neutron activation.

Hot Tap – A procedure used in repair, maintenance, and services activities that involves

welding on a piece of equipment (pipelines, vessels, or tanks) under pressure to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Hot work – Operations including cutting, welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar situation.

Hot work permit – SNL's written authorization, issued by fire protection personnel, to perform operations that could provide a source of ignition, such as riveting, welding, cutting, burning, or heating.

House system – A liquid or gas handling system typically installed and maintained by the Mechanical & Civil Engineering Department in New Mexico or the Facilities Planning and Engineering Department in California. House systems are supplied from a large volume tank located outside the associated building, with liquid or gas phase product piped into individual laboratories.

Housekeeping – Includes properly maintaining and storing items within the workplace, observing safety precautions, and picking up, wiping up, sweeping up, and removing scrap and waste from all places of employment, including passageways, storerooms, and service rooms to reduce carelessness and clutter, the most common causes of fires and accidental injuries; provide a visual indication of a safe, efficient workplace; and improve morale. Housekeeping includes keeping working surfaces clean and orderly, as well as the removal of excess material and waste. Lack of housekeeping creates hazardous conditions and is a symptom of unorganized, unplanned, and sloppy methods and management.

HWMF – Hazardous Waste Management Facility

Hypothermia – A reduction of the [core body temperature](#) to 36 ° C or less.

Ignitable – Liquids with a flash point less than 140 F; solids that are capable of ignition and vigorous burning through friction, moisture absorption, or spontaneous chemical changes; compressed gas defined ignitable under 49 CFR 173.300; and oxidizers.

Illegal drugs – A controlled substance included in Schedule I or II of the *Controlled Substance Act*, as defined by section 802 (6) of Title 21 of the U.S. Code, the possession of which is unlawful under chapter 13 of that Title. This term does **not** include controlled substances used with a valid prescription or other uses authorized by law.

Imminent danger – Conditions, acts, or events, which could reasonably be expected to cause death or serious physical harm, including loss of material resources and environmental concerns.

Implementation plan (IP) – The plan developed by the Operational Readiness Review (ORR) or Readiness Assessment (RA) team that describes the specifics of approach, schedule, methodology, team members and their qualifications, and reporting requirements of the ORR or RA. The Implementation Plan (IP) is used by the team leader to execute the ORR or RA.

Import – To bring a chemical substance or mixture or article containing a chemical substance or mixture into the customs territory of the U. S. for use or distribution.

Incident commander (IC) – The individual responsible for the management of all incident operations to include the development and implementation of strategic decisions and approving the ordering and releasing of resources. The IC serves as the single authority in command and control at the incident scene, and has authority to commit SNL funds and other resources as deemed necessary during emergencies. The IC is also authorized access to all SNL-controlled facilities and categories of information in performance of emergency mitigation duties.

Incidental Laser Personnel – Personnel who do **not** work directly with Class 3b or 4 lasers but have Management approval to enter or work in [Laser Controlled Area](#) when lasers are in operation.

Incompatible waste – The concept of incompatibility refers to the spontaneous interaction between chemicals or chemicals and material that can harm human health or the environment through:

- Violent reactions.
- Release of toxic or flammable fumes.
- Fire or explosion.
- Evolution of heat and pressure.

Independent [USQ process] – An individual that has not previously been involved in the preparation of a particular USQ document (the individual does not need to be organizationally independent).

Independent reviewer – A knowledgeable individual who is responsible for the performance of a technical review or safety review and who has no direct technical or management responsibility for performance of the activities being reviewed. Using a [graded approach](#), a reviewer may be a member of the same organization, if appropriate.

Individual-controlled lockout/tagout – Application of a lock and tag on each energy source isolating device by an authorized worker who applies the locks and tags for his or her personal protection.

Indoor air pollutant – A substance that has the potential to adversely affect the occupants of a building by virtue of its presence in the air inside the building. Examples of indoor air pollutants include the following:

- Carbon dioxide
- Combustion products
- Pesticides
- Chemicals, including organic solvents and vapors
- Offgassing from building material, insulation, or furniture
- Dust
- Bioaerosols
- Allergens
- Odors
- Radon

Indoor air quality – Air quality in the work environment and is a function of the level of indoor air contaminants or pollutants.

Industrial – Of or relating to [industry](#).

Industrial facilities, high-hazard – See definition of "[high-hazard industrial operations](#)."

Industrial facilities, low-hazard – See definition of "[low-hazard industrial operations](#)."

Industrial operations, moderate hazard – See definition of "[moderate-hazard industrial operations](#)."

Industrial robot – A re-programmable multifunctional manipulator designed to move materials, parts, tools, or specialized devices through variable programmed motions for the performance of a variety of tasks.

Industrial Robot System – A system that includes industrial robots and the devices and sensors required for the robots to be taught or programmed, or for the robots to perform the intended automatic operations, as well as the communication interfaces required for interlocking, sequencing, or monitoring the robots.

Industrial Solid Waste – A type of [solid waste](#) that meets all of the following criteria:

- Generated by a manufacturing or industrial process.
- Does not meet the definition of a [hazardous waste](#) (see Section 19A, "Hazardous Waste Management," under the topic, "[Waste Identification](#)," for further information).

Industry – A systematic labor especially for some useful purpose or the creation of something of value.

Inert – Within the context of this document, inert gases or liquids exhibit little or no chemical reactivity. Examples include nitrogen, helium, and argon.

Infectious waste – Per 20 NMAC 9.1, a limited class of substances (also called medical waste or biohazardous waste) that carry a probable risk of transmitting disease to humans, including but not limited to:

- Microbiological laboratory wastes, including cultures and stocks of infectious agents from clinical research and industrial laboratories, and disposable culture dishes and devices used to transfer, inoculate and mix cultures;
- Pathological wastes, including human or animal tissues, organs and body parts, removed during surgery, autopsy or biopsy;
- Disposable equipment, instruments, utensils, and other disposable materials which require special precautions because of contamination by highly contagious diseases;
- Human blood and blood products, including waste blood, blood serum, and plasma;
- Used sharps, including used hypodermic needles, syringes, scalpel blades, Pasteur pipettes and broken glass; and
- Contaminated animal carcasses, body parts and bedding, especially those intentionally exposed to pathogens in research, in the production of biologicals or the "in vivo" testing of pharmaceuticals.

Injury/Illness Non-Recordable – Injury/Illness not requiring medical attention: beyond first aid: i.e. non-prescription medication at non-prescription strength, hot/cold therapy, wound covering such as bandages or Steri Stripes™, etc.

Inspector [Lockout/tagout definition] – A lockout/tagout-authorized worker, other than the one(s) using the energy-control procedure being inspected.

Institutional Biosafety Committee – is a committee that: (I) meets the requirements for membership specified in Section IV-B-2, Institutional Biosafety Committee (IBC), and (ii) reviews, approves, and oversees projects in accordance with responsibilities defined in Section IV-B-2, Institutional Biosafety Committee (NIH Guidelines For Research Involving Recombinant DNA Molecules).

Instructor – An individual who presents classroom, laboratory, on-the-job, or simulator instruction, or one who develops training programs and materials, and/or evaluates trainees.

Instructor qualification –The process of determining and verifying that individuals meet the instructional and technical competence qualification criteria for a specific instructor qualification level.

Integrated Safety Management System (ISMS) – ISMS is both a DOE initiative and Sandia's response to that initiative. It sets the framework for ensuring that all DOE and contractor work is performed safely. The seven DOE and SNL **guiding principles** for safety management are

- Line management responsibility for safety
- Clear roles and responsibilities
- Competence commensurate with responsibilities
- Balanced priorities
- Identification of safety standards and requirements
- Hazard controls tailored to work being performed
- Operations authorization.

SNL's five **safety management functions** are

- Plan work
- Analyze hazards
- Control hazards
- Perform work



- Feedback and improve

For more, specific information, see [CPR 400.1.2](#), *Sandia National Laboratories' Integrated Safety Management System*, and [CPR 400.1.2.1](#), *Sandia National Laboratories' Integrated Safety Management System Implementation Plan*.

[Integrated Safety Management System \(ISMS\) software](#) – A software tool used by Members of the Workforce to:

- Identify and analyze hazards applicable to an operation.
- Identify and evaluate potential requirements and controls.
- Identify applicable safety documentation.
- Provide building profiles information for the Emergency Operations Center (EOC).



The primary module of the ISMS software is the primary hazard screening (PHS) with integral hazards analysis (HA). Additional functionality of the software has been added to provide search, rollover, and document maintenance capabilities.

Interstate – Refers to trade, traffic, or transportation in the U.S. that is between a place in a state and a place outside of such state (including a place outside the U.S.) or is between two places in a state through another state or a place outside of the United States.

Note: The Federal Highway Administration has interpreted interstate commerce to be determined by the essential character of the movement, manifested by the shipper's fixed and persistent intent at the time of shipment, and is ascertained from all of the facts and circumstances surrounding the transportation. When the intent of the transportation being performed is interstate in nature, *even when the route is within the boundaries of a single State* [emphasis added], the driver and commercial motor vehicle are subject to the federal motor carrier safety regulations.



Intrastate – Refers to any trade, traffic, or transportation in any state that is not described in the definition of "[interstate](#)" commerce.

Irritant – A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

J

JIT – Just-in-Time

Job analysis – A systematic method used in obtaining a detailed listing of the tasks of a specific job.

Joint Firearms Safety Committee – A committee appointed and chartered to develop, review, and evaluate the firearms safety programs for all SNL sites. The committee is comprised of safety and security representatives from SNL/NM, SNL/CA, and TTR. The committee is tasked to:

- Develop the Firearms Safety Program for SNL.
- Conduct annual firearms safety appraisals at SNL/NM, SNL/CA, and TTR.
- Provide a forum for sharing information and discussing firearms safety issues.
- Meet at least once a year to review implementation of the Firearms Safety Program within SNL and provide recommendations for approval.

K

KAFB – Kirtland Air Force Base

KAO – Kirtland Area Office (historical; see [OKSO](#))

k_{eff} – The effective neutron multiplication factor, which is the ratio of the average rate of neutron production by fission to the average rate of loss by absorption and leakage. (k is the self-multiplication that would result if there were an infinite array of the package type being evaluated.)

KTF – Kauai Test Facility

L

Laboratory – A facility where the "Laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory Leadership Team (LLT) – SNL executive management team that focuses on information exchange and global issues.

Laboratory Operations Council (LOC) – A council that approves the corporate-level metrics used to monitor SNL's ES&H Program and resolves high-level ES&H issues. The Laboratory Operations Council is chaired by the Executive Vice President and includes all division vice presidents.

Laboratory scale – Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces that function to produce commercial quantities of material.

Laboratory use of hazardous chemicals – (Applies to OSHA Laboratory Standard locations.) Handling or use of such chemicals in which all of the following criteria are met:

- Chemical manipulations are carried out on a "[laboratory scale](#)."
- Multiple chemical procedures or chemicals are used.
- The procedures involved are not part of a production process, nor in any way simulate a production process.
- "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

LAr – Liquid argon. The temperature of LAr at atmospheric pressure is ≈ 87.3 K (≈ -302 °F).

Laser – A device that produces an intense, coherent, directional beam of light by stimulating electronic or molecular transitions to lower energy levels. An acronym for Light Amplification by Stimulated Emission of Radiation.

Laser Controlled Area – An area where the occupancy and activity of those within is subject to control and supervision for the purpose of protection from Class 3b or 4 laser radiation.

Laser Managers – Those who have the responsibility for authorizing [Qualified Laser Operators](#) and [Incidental Laser Personnel](#).

Laser safety officer (LSO) – The laser safety officer (one at SNL/NM and one at SNL/CA) is assigned to define and monitor the control of hazardous laser operations.

LDRD – Lab-directed research and development

Learning objective – A statement specifying measurable behavior that a trainee should exhibit after instruction, including the conditions and standards for performance.

Legacy items – Items for which a complete history cannot be verified because its owners do not know:

- Where it came from.

- The previous owner.
- How it has been used in the past.

Lesson plan – An instructor’s document that outlines instructor and trainee activities, learning objectives, lesson content, and resources necessary for the consistent conduct of training.

Lessons learned – Good work practices or innovative approaches that are captured and shared to promote repeat application. Lessons learned may also be adverse work practices or experiences that are captured and shared to avoid recurrence.

Less-than-90-day accumulation area – A hazardous waste or mixed waste accumulation location meeting the requirements in 40 CFR 262.34(a) as described in [Section 19A](#), Attachment 19A-1.

LH₂ – Liquid hydrogen. The temperature of LH₂ at atmospheric pressure is ≈ 20.3 K (≈ -423 °F).

LHe – Liquid helium. The temperature of LHe at atmospheric pressure is ≈ 4.2 K (≈ -452 °F).

Lift, critical – A lift for which the application of requirements applicable to ordinary lifts would not adequately eliminate or control the likelihood or severity of the following:

- Personnel injury or significant adverse health impact (onsite or offsite). Significant release of radioactivity or other hazardous material or other undesirable conditions.
- Undetectable damage that would jeopardize future operations or the safety of a facility.
- Damage that would result in delay to schedule or other significant program impact such as loss of vital data.

Lift, pre-engineered – Repetitive, production-type lifting operation, independent of the nature of the load to be lifted, in which the probability of dropping, upset, or collision is reduced to a level acceptable to the responsible manager by:

- Preliminary engineering evaluation.
- Specialized lifting fixtures.
- Detailed procedures.
- Operation-specific training.

- Independent review and approval of the entire process.

Lifting device – A device that hooks directly onto and unhooks from a crane hook and is not reeved onto the hoist ropes (e.g., hook-on buckets, magnets, grabs, other supplemental devices) used for handling certain types of loads. The weight of this device is part of the rated load.

Light earth moving equipment – Term used to refer to the following types of equipment:

- Farm-type tractors (1-yard bucket capacity)
- Backhoes
- Steer-skid type of light earth moving equipment
- Front-end loaders (smaller than 2 ½-yard bucket capacity)
- Dump trucks (smaller than 10-yard capacity)

Limited quantity (hazardous material) – When specified to a particular hazardous material, limited quantity is the maximum amount of the material for which there is a specific labeling or packaging exception.

Limited quantity (radioactive material) – A quantity that does not exceed the material packaging limits specified in 49 CFR 173.423 and that conforms with the requirements specified in 49 CFR 173.421.

Limiting control settings – Are the settings on safety systems that control process variables to prevent exceeding a safety limit.

Line item number – The number associated with the waste item as entered on the disposal request. For example, the first item listed on a CWDR is line item number one, the second item listed is line item number two, etc.

Line-managed training – Any training that teaches the knowledge and/or skills needed to safely and effectively function within a specific line working environment and is not owned by Corporate Learning and Professional Development (CL&PD).

Line management – The process of managing workers through individual [Integrated Job Structure](#) assignments (i.e., work titles) and contractor positions that support SNL's mission core processes and enabling processes.

Line-of-sight – The linkage of an employee's performance objectives to higher-order

departmental, center, division, or corporate objectives.

LIWG – Line Implementation Working Group

LLNL – Lawrence Livermore National Laboratory

Local Area Network Material Accountability System (LANMAS) – The MC&A database used at Sandia and elsewhere within the DOE complex.

Local Exhaust Ventilation (LEV) – An airflow system designed to capture and remove process emissions before they escape into the workplace (as opposed to a dilution ventilation, which dilutes contaminated workplace air with uncontaminated air). LEV equipment includes, but is not limited to, laboratory fume hoods, gas cabinets, canopy hoods, glove boxes, welding exhaust, machine tool exhaust, plating tank exhaust, and portable ventilation (e.g., HEPA-filtered radiation containment, portable welding exhaust, and portable dust control systems). A local exhaust ventilation system consists of all equipment associated with removal of contaminants, such as the fan, ductwork, stack, and air-cleaning device.

LN₂ – Liquid nitrogen. The temperature of LN₂ at atmospheric pressure is ≈ 77.4 K (≈ -320 °F).

Lockbox – In group lockout situations, a metal box into which the principal authorized individual inserts keys for locks that secure [energy source isolating devices](#).

Lockout – The placement of a lockout device on an energy-source-isolating device in accordance with an established procedure that ensures the energy-source-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device – A device that uses a positive means such as a lock, either key or combination type, to hold an energy-source-isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Lockout/tagout – Application of an SNL-standardized lock, appropriate lockout device, and danger tag on an [energy source isolating device](#).

Lockout/tagout-affected personnel – Those who operate equipment or a system that authorized personnel service under lockout/tagout or whose job requires them to work in an area where authorized personnel perform lockout tagout activities. Because any individual working at SNL can possibly be in an area where lockout/tagout is performed, **all** SNL personnel are lockout/tagout-affected personnel.

Lockout/tagout-authorized personnel – SNL personnel who are trained and qualified to implement a lockout/tagout procedure on equipment, processes, or systems in order to perform

service operations. Lockout/tagout-authorized personnel and [lockout/tagout-affected personnel](#) may be the same people when the duties of the lockout/tagout-affected personnel include servicing the equipment, process, or system that must have a lockout/tagout. Visitors may **not** be lockout/tagout-authorized personnel.

Low-hazard industrial operations – Low-hazard industrial operations are those that only have localized impacts on people or the environment. Low-hazard industrial facilities have hazards or operations that could potentially cause significant injury and require the hazards analysis (HA) section of the PHS to be completed.

DOE unique hazards or public-perceived DOE unique hazards such as explosives, radiological materials, high-powered lasers, rail guns, biological, etc., would be considered low-hazard operations and would require additional analysis and documentation, which could result in a potentially higher hazard classification.

Low-hazard review (LR) – A graded-approach to readiness reviews required by DOE. The LR for non-nuclear low hazard classification operations at SNL consist of completing a verification checklist to document that the following items have occurred:

- Primary Hazard Screening (PHS) approved
- Hazards Analysis (HA) approved
- Required training completed by appropriate personnel
- Technical work document (TWD) completed, including procedures, permits, etc.
- DOE notified if explosives have been identified in the PHS
- Operation-specific issues addressed (e.g., new construction completed, current calibration, etc.)

Lower-tier document - An attachment to a TWD or a “stand-alone” document referenced by a parent TWD that is required for completing the TWD but may be used apart from the parent document to assist in or document the successful accomplishment of the task or activity. Examples of “Lower-tier documents” include, but are not limited to; checklists, operator aids, forms, maps, flowcharts, etc.

LR – Low-hazard review.

Low-level radioactive waste – [Radioactive waste](#) that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the Atomic Energy Act of 1954, as amended), or [naturally occurring radioactive material \(NORM\)](#).

LOX – Liquid oxygen. The temperature of LOX at atmospheric pressure ≈ 90.2 K (≈ -297 °F).

LSO – See definition of "[laser safety officer](#)."

M

Machine shop equipment – Includes equipment such as lathes, mills, saws, shears, drill presses, grinders, press breaks, jointers, planers, etc. This equipment is used to work on metal, wood, plastic, ceramic, as well as other materials.

Major event – An event on the timeline developed for root cause analyses of occurrences.

Major modification – A modification to a DOE nuclear facility that is completed on or after April 9, 2001, that substantially changes the existing safety basis of the facility.

Malfunction – Failure to perform as expected. Includes non-performance, mal-performance, and spurious operations. Also includes reduction in reliability, which increases probability of malfunction.

MAN – Management assurance notebook

Manufacture – To make into a product suitable for use.

Manufacture for commercial purposes (TSCA) – import, produce, or manufacture with the purpose of obtaining an immediate or eventual commercial advantage for the manufacturer. Chemical substances produced coincidental to manufacture, processing, use or disposal of another chemical substance or mixture also is considered manufacturing for commercial purposes.

Margin of safety – The margin built into the safety analysis of a facility as set forth in the [authorization basis acceptance limits](#).

Material balance area (MBA) – An area approved by the Material System and Security Audits Department (7442) for the use, processing, or storage of nuclear material (including special nuclear material). Nuclear material shall reside in an MBA unless the material is in transit.

Material handling – Lifting, moving, and placing (either manually or with equipment) anything used by people.

Material handling equipment – Equipment that includes forklifts, hoists/cranes, motorized hand trucks, etc.

Material safety data sheet (MSDS) – A document that summarizes associated hazards and safe practices required for handling, using, and storing chemicals in general and does not include specific applications. An MSDS identifies the manufacturer or distributor and describes the chemical with information on composition and ingredients. An MSDS also contains information on:

- Health hazards.
 - First aid, firefighting, and accidental release measures.
 - Handling and storage.
 - Exposure limits, exposure controls, and [personal protective equipment \(PPE\)](#).
 - Physical and chemical properties.
 - Stability and reactivity.
 - Toxicological and ecological information.
 - Disposal considerations.
- Transport, regulatory, and other information.

Materials of trade – A hazardous material, other than a hazardous waste, that is carried on a motor vehicle (1) for the purposes of protecting the health and safety of the motor vehicle operator or passengers, (2) for the purpose of supporting the operation or maintenance of a motor vehicle, or (3) in direct support of a principal business that is other than transportation by motor vehicle (e.g., check source, source radiography unit, lead paint analyzer).

Maximally exposed individual (MEI) – The location of a member of the public which receives or has the potential to receive the maximum radiological dose from air emissions of a [National Emissions Standards for Hazardous Air Pollutants \(NESHAP\)](#) radionuclide source.

Maximum Permissible Exposure (MPE) – The level of laser radiation to which a person may be exposed without hazardous effect or adverse biological changes in the eye or skin.

May – Term used to indicate optional, non-mandatory practices.

Means of egress – A continuous and unobstructed way of exit travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (a) the exit access, (b) the exit, and (c) the exit discharge. A means of egress comprises the vertical and horizontal travel and includes intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts,

and yards.

Medical consultation – A consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

Medical surveillance – The systematic collection, analysis, and evaluation of health data to identify disease cases, patterns, or trends suggesting adverse health effects and the need for further investigation, evaluation, and/or remedial action.

Medical waste – See "[Infectious waste](#)."

Medical waste (California) – A biohazardous or sharps waste from diagnosis, treatment, or immunization of human beings or animals, or research pertaining to these activities, trauma scene waste, or production or testing of biologicals made from living organisms and their products, including, but not limited to, serums, vaccines, antigens, and antitoxins. (Also see [Infectious Waste](#))

Members of the Workforce – For purposes of CPR400.1.1/MN471001, *ES&H Manual*, and its supplements, Members of the Workforce are:

- Sandia employees.
- Contractor employees as specified in CPR400.1.1/MN471001, *ES&H Manual*, [Section 1B](#), "What Is the Scope."

Metallic lead – Any item comprised of pure elemental lead. Examples include, but are not limited to, bricks and sheets commonly used for shielding, lead shot, granules, balance weights, etc.

Microorganism – A microscopic organism, such as bacteria, fungi, viruses, or rickettsiae.

Migratory birds – All birds listed within the Migratory Bird Treaty Act, [50 CFR 10.13](#), or which are a mutation or hybrid of any such species, including any part, nest, or egg.

Milestone – The ending point of a corrective action or other activity. For corrective actions in Corrective Action Plans, milestones generate evidence packages for internal review and transmission to appropriate external organizations.

Military munitions – all ammunition products and components produced or used by or for the U.S. Department of Defense or the U.S. Armed Services for national defense and security,

including military munitions under the control of DoD, DOE, the U.S. Coast Guard, and National Guard personnel. Military munitions include:

- Confined gaseous, liquid, and solid propellants
- Explosives
- Pyrotechnics
- Chemical and riot control agents
- Smokes
- Incendiaries used by DOD components, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof

Military munitions do not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components thereof. However, the term does include non-nuclear components of nuclear devices, managed under DOE's nuclear weapons program after all required sanitization operations under the Atomic Energy Act of 1954, as amended, have been completed.

Minimum Margin of Subcriticality (•k MMS) – An administrative allowance prescribed in the [NCS Program](#) and applied to the effective neutron multiplication factor beyond that necessary to account for calculational bias to ensure subcriticality.

Minor – An individual less than 18 years of age.

Mitigated consequence – When performing a Hazards Analysis (HA), the consequence has been made less harsh or hostile; less severe or painful. Example: a mitigated consequence may be a controlled or minimized event or lack of event due to other additional controls.

Mixed waste – Radioactive waste that also contains a hazardous waste regulated by the Resource Conservation and Recovery Act (RCRA), or that is regulated by the state.

Moderate-hazard industrial operations – Moderate-hazard industrial operations are those that have the potential for significant onsite impacts to people or to the environment.

Motorized equipment – This classification includes powered carts and special-use equipment (construction equipment, road building machinery, farm tractors, etc.) that may travel over roadways used by vehicles, bicycles, or pedestrians.

Motorized hand truck – An electric-powered hand truck that is designed to be controlled by either a walking operator or a stand-up riding operator.

Movement – A routine relocation of property or material within a building or within the access-controlled boundaries of a facility necessary to support "work in progress," or the day-to-day operations or activities of an organization. A movement generally does not involve the transfer of responsibility or accountability for the property or material being moved and usually does not need to be done by trained personnel from one of the transportation organizations.

mrem – One thousandth of a rem

MSDS – Material safety data sheet

MSR – Maintenance service request

Munitions – Small arms ammunition, diversionary devices, and explosives.

Musculoskeletal stressor – Repetitive motions, forceful exertions, awkward or static postures, mechanical contact, muscle fatigue, vibration, and/or temperature extremes that may lead to disorders of the muscles, tendons/tendon sheaths, nerves, and/or blood vessels.

N


N₂ – Nitrogen (gas phase)

Nanomaterial – Materials incorporating engineered nanoparticles or nanoscale features that exhibit unique physical and chemical properties as a result of the nanoparticles or nanoscale features.

Nanoparticle – In nanotechnology, a sub-classification of ultrafine particle with lengths in two or three dimensions greater than 0.001 micrometer (1 nanometer) and smaller than about 0.1 micrometer (100 nanometers) and which may or may not exhibit a size-related intensive property. The length scale may be a hydrodynamic diameter or a geometric length appropriate to the intended use of the nanoparticle.

Nationally recognized testing laboratory (NRTL) – A laboratory recognized by OSHA that qualifies products for safe operation. For example, Underwriters Laboratory® (UL), Factory Mutual (FM), Canadian Standards Association (CSA), and Electro Test Incorporated (ETI).

Naturally Occurring Radioactive Material (NORM) – Naturally-occurring materials that are not regulated under the Atomic Energy Act of 1954, as amended, whose composition,



radionuclide concentrations, availability, or proximity to man have been increased by or as a result of human practices. For the purposes of this manual, NORM also includes the natural radioactivity of rocks, soils, and other materials in its natural composition and concentration.


NCS engineer (NCSE) – Engineers with responsibilities for NCS under the [NCS Program](#). NCSEs may be contacted by using the [CSO's website](#).

Near proximity – Within five miles or ten minutes travel of medical facilities.


NEPA – National Environmental Policy Act

Nephrotoxins – Chemicals which produce kidney damage.

NESHAP – National Emissions Standards for Hazardous Air Pollutants



NESHAP radionuclide source – Any radioactive material or process that releases or has a reasonable potential to release radionuclides into the environment through an air emission. NESHAP radionuclide sources may be located at existing facilities or at locations scheduled for new construction. Potential sources include, but are not limited to, any of the following types of material and processes:

- Radioactive or activated material, such as:
 - Tritium or tritium waste
 - Fission products
 - Uranium or depleted uranium
 - Radiation sources (e.g., neutron sources)
 - Accelerators, reactors, or radiation-generating machines
 - Glove boxes
 - Stored radioactive or mixed waste
- 

Net explosive weight (NEW) – The weight of an explosive itself or an explosive contained within an ordnance item or device.

Neurotoxins – Chemicals which produce their primary toxic effects on the nervous system.

New chemical – Chemical substance not listed on the TSCA inventory list.

NFPA – National Fire Protection Association

NIR – Nonionizing radiation (see the definition of "[nonionizing radiation \[NIR\]](#)")

Nominal Hazard Zone (NHZ) – The space within which the level of the direct, reflected, or scattered radiation during normal operation exceeds the applicable level of [Maximum Permissible Exposure \(MPE\)](#). Exposure levels beyond the boundary of the NHZ are below the appropriate MPE level.

Non-beryllium use area – Is an area that is not an operational area or an area where beryllium activity is performed. This includes, but is not limited to, laboratories, offices, test facilities on Sandia-controlled premises as well as other DOE facilities to which 10CFR850 has not been directly applied and implemented.

Noncommercial equipment – Equipment, apparatus, or material that cannot be purchased from a retail outlet or manufacturer and, therefore, must be designed and fabricated at Sandia. Noncommercial equipment includes systems or devices that are built by Sandia organizations using individual commercially available components. For example, a lifting or hoisting fixture built by Sandia for a specific task.

Noncompliance (Safety Rules) – Failure to comply with a Price-Anderson Amendments Act (PAAA) Nuclear Safety Rule or Worker Safety and Health Program requirement. A noncompliance may also be a nonconformance with Sandia business rule requirements.

Noncompliance Tracking System (NTS) – A centralized DOE database that allows Sandia to report issues and noncompliances promptly and potentially take advantage of mitigation provisions described in the DOE *Office of Enforcement, Enforcement Program Plan*. Any potential noncompliance will be reviewed by the [Sandia Safety and Security Issues Review Committee \(SSIRC\)](#), the issue owner, and the responsible manager before entering it into the DOE NTS. Input to the NTS reporting system will be managed by the [Sandia Safety and Security Regulatory Support Office \(SSRSO\)](#).

Nonconformance (Safety Rules) – Failure to comply with a Sandia business rule requirement or a process used to implement business rules.

Nonemergency – An unplanned situation that does not pose imminent danger or require immediate assistance, but could affect:

- Health and safety of Members of the Workforce and the public.
- Protection of the environment.
- Security of operations.

Nonemergency, medical – Minor illness or injury that is not life-threatening.

Nonexempt process – A process where the amount of [fissile material](#) exceeds the threshold limits.

Nonfacilities asbestos – Any asbestos or asbestos-containing material other than that defined as [facilities asbestos](#). Examples of items that contain nonfacilities asbestos include the following:

- Heaters
- Fireproof safes
- Ovens
- Labware such as gloves and hot pads

See also "[asbestos](#)," "[friable asbestos](#)," and "[facilities asbestos](#)."

Nonionizing radiation (NIR) – Energy in the electromagnetic spectrum with wavelengths between 10^6 centimeters (cm) (extremely low radio frequency) to 10^{-5} cm (ultraviolet light) and with frequencies between 0 megahertz (MHz) and 3×10^5 MHz. This includes:

- Static magnetic and electric fields (i.e., frequency of 0 Hertz [Hz])
- Sub-radio frequency magnetic and electric fields (i.e., frequencies from <1 Hz to 30 Kilohertz [kHz] and wavelengths between 10^{10} cm and 10^6 cm)
- Radio frequency and microwave radiation (i.e., frequencies between 30 kHz to 300 Gigahertz [GHz] and wavelengths between 10^6 cm to 0.1 cm, respectively)
- Infrared light (i.e., frequencies between 300 GHz and 4.0×10^5 GHz and wavelengths between 0.1 cm and 7.6×10^{-5} cm, respectively)
- Visible light (i.e., frequencies between 4.0×10^5 GHz and 7.5×10^5 GHz and wavelengths between 7.6×10^{-5} cm and 4.0×10^{-5} cm, respectively)
- Ultraviolet light (i.e., frequencies between 7.5×10^5 GHz and 3.0×10^6 GHz and wavelengths between 4.0×10^{-5} cm and 1.0×10^{-5} cm, respectively)

Examples of nonionizing radiation sources to which workers could be exposed to energy levels in excess of current published exposure limits include experimental or diagnostic systems which

propagate:

- Static electric and magnetic fields into the general work area (i.e., electromagnets in e-beam applications, pulsed-power applications).
- Sub-radio frequency electric and magnetic fields into the general work area (i.e., high-current power transmission, pulsed-power applications).
- Radio frequency and microwave energy into the general work area (i.e., anechoic chamber studies, radar tracking equipment).
- Infrared light, intense visible light and black body energy, and ultraviolet light into the general work area (i.e., use of metal vapor arc lamps, high-current discharge lamps, or radiant heat sources).

Nonpotable water – Water that does not meet the quality standards set for potable water. Nonpotable water may be contaminated or untested.

Nonpotable water system – Series of pipes and valves (usually underground and running through the walls of buildings) that remove [nonpotable water](#) from a location (e.g., [Sandia-controlled premises](#), City of Albuquerque, pueblo, or other civil entity) into a larger sanitary sewer system for appropriate disposal. In some locations, nonpotable water systems also deliver nonpotable water for appropriate uses.

Nonreactor nuclear facility – Those activities or operations that involve radioactive or fissionable materials in such form and quantity that a nuclear hazard potentially exists to SNL personnel or the general public. Included are activities or operations that:

- Produce, process, or store radioactive liquid or solid waste, fissionable materials, or tritium.
- Conduct separation operations.
- Conduct irradiated materials inspection, fuel fabrication, decontamination, or recovery operations.
- Conduct fuel enrichment operations.
- Perform environmental remediation or waste management activities involving radioactive materials.

Nonroutine transfer – The transfer of property or material that is required to meet an "emergency" or unique "one-time" need. Nonroutine transfers also include those transfers where special conditions exist that require deviations from existing approvals.

Nonsubstantive document change – Revisions, modifications, and upgrades to written documentation that are editorial and do not affect safety, such as the following:

- Correct spelling or punctuation
- Adding (but not deleting) sign-off spaces
- Highlighting in-text notes, cautions, and warnings through the use of boxes, shading, bolding, tables, or similar means
- Changing organizations or personnel titles that do not reassign responsibilities and that are not referred to in the technical safety requirements (TSRs)
- Making changes that clearly do not alter functions, meaning, or intent, such as the following examples:
 - Changes in grammar
 - Standardization in presentation format
 - Replacement of references with direct extracts from the references
 - Changes that do not alter the conduct of procedural steps

Non-Occurrence Trackable Event (NOTE) – An event that **does not** meet DOE criteria for occurrence reporting, but has potential for serious adverse ES&H impact and is potentially a precursor event.

Non-permit confined space (NPCS) – A confined space that does **not** contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Non-Security use of firearms – Use of firearms on Sandia-controlled premises and DOE live-fire shooting ranges, and at other locations where Members of the Workforce are engaged in approved activities, such as the following examples in a Research and Development (R&D) environment which include, but are not limited to:

- Designing new firearms.
- Modifying firearms (i.e., making a new barrel for accuracy).
- Testing firearms and or ammunition (i.e., ballistic research).
- Incorporating firearms into other systems (i.e., remotely operated platforms).
- Using firearms in association with other activities (i.e., live-fire night vision testing).

- Firearms disassembly and non-traditional firearms re-application.
- R&D work for firearm parts (i.e., smart trigger locks).
- Laboratory work.
- Firearms - displays/demonstrations.
- Storing firearms.
- Other live-fire activities.

NORM – Naturally occurring radioactive material

Normal operation – Use of equipment to perform its intended function. Operating safeguards, such as machine guards and barriers, are in place to protect SNL personnel during equipment operation.

Normally unoccupied remote facility – A facility that is operated, maintained, or serviced by Members of the Workforce who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks (i.e., no Members of the Workforce are permanently stationed at the facility). Facilities meeting this definition are not contiguous with, and must be geographically remote from all other buildings, processes, or persons. <From 29 CFR 1926.64>

Noteworthy Practice - A process or condition indicating exceptional or innovative policy, practice, or performance.

Noteworthy practice [firearm safety definition] – Practice that effectively and efficiently implements or exceeds Sandia requirements or DOE order or implements a [best management practice](#).


NPCS – Non-permit confined space.

NRTL – Nationally recognized testing laboratory

NTS – Nevada Test Site

Normal operation – Use of equipment to perform its intended function. Operating safeguards, such as machine guards and barriers, are in place to protect Members of the Workforce during equipment operation.

Nuclear accident dosimetry (NAD) – radiation dosimetry that responds to nuclear [criticality](#)



[accidents](#) and meets specifications such as in [10 CFR 835.1304](#).


Nuclear criticality accident – An accident in which [fissile material](#) accumulations produce a self-sustaining neutron chain reaction leading to a high potential for excessive radiation doses.

Nuclear criticality safety (NCS) – Described in the [NCS Program](#).

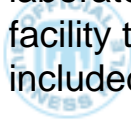
Nuclear facility – A nuclear facility means reactor and nonreactor nuclear facilities as defined in DOE 5480.23, that require the preparation of a Safety Analysis Report (SAR).

Nonreactor nuclear facility means those activities or operations that involve radioactive and/or fissionable material in such form and quantity (see [DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*) that a nuclear hazard potentially exists to employees or the general public.

Included are activities or operations that:

- 
- Produce, process, or store radioactive liquid or solid waste, fissionable material, or tritium.
 - Conduct separation operations.
 - Conduct irradiated material inspection, fuel fabrication, decontamination, or recovery operations.
 - Conduct fuel enrichment operations.
 - Perform environmental remediation or waste management activities involving radioactive material.

Incidental use and generating of radioactive material in a facility operation (e.g., check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and x-ray machines) would not ordinarily require the facility to be included in this definition. Accelerators and reactors and their operations are not included.



Reactor means, unless it is modified by words such as containment, vessel, or core, the entire reactor facility, including the housing, equipment, and associated areas devoted to the operation and maintenance of one or more reactor cores. Any apparatus that is designed or used to sustain nuclear chain reactions in a controlled manner, including critical and pulsed assemblies, and research, test, and power reactors, is defined as a reactor. All assemblies designed to perform subcritical experiments that could potentially reach criticality are also to be considered reactors. Critical assemblies are special nuclear devices designed and used to sustain nuclear reactions. Critical assemblies may be subject to frequent core and lattice

configuration change and may be used frequently as mockup of reactor configurations.

Nuclear facility [USQ process] – (also known as a hazard category 1, 2, or 3 DOE nuclear facility) – A reactor or a nonreactor nuclear facility where an activity is conducted for or on behalf of DOE and includes any related area, structure, facility, or activity to the extent necessary to ensure proper implementation of the requirements established in 10 CFR 830.

Nuclear Facility (segmentation) – Nuclear facilities may be segmented for the purpose of hazard categorization and estimating hazardous material inventory provided the hazardous material in one segment could not interact with hazardous materials in other segments from a common severe phenomenon. For example, independence of heating, ventilation, and air conditioning (HVAC) and piping must exist in order to demonstrate independence for facility segmentation purposes.

Nuclear safety – Safety issues related to exposure of facility personnel and the public to radioactive material and radiation from nuclear facilities and operations.

Nuclear safety nonconformance – A nonconformance with a business rule that has PAAA significance (i.e., potentially enforceable under a PAAA Nuclear Safety Rule).

Numbered property or equipment – Items that are labeled with a property number on a barcode label. Examples of numbered property include the following:

- Personal computers (PCs) and PC-related equipment
- Lab equipment
- Cellular phones

O

O₂ – Oxygen (gas phase)

Observation - A statement of fact based on objective evidence documenting an act or condition that does not violate a requirement but may need improvement.

Observation/Opportunity for Improvement (OFI) – Information that identifies a concern and is not Department of Energy (DOE) directive or site procedure driven. Observations that are left unresolved could result in a finding in subsequent assessments.

Observation [firearm safety definition] – A factually-supported indication of a trend or deficiency that, if not corrected, could result in a violation of a Sandia requirement or DOE order.

Observation (with respect to the startup and restart process at SNL) – An item identified during the Operational Readiness Review (ORR) or Readiness Assessment (RA) process that is not a regulatory requirement but that, if implemented, would lead to enhanced operations. A discussion of observations should be included in the ORR report. The ORR and RA teams are not required to track the completion of observations.

Occupational exposure – The reasonably anticipated occurrence of skin, eye, other mucous membrane, or parenteral contact with blood or [other potentially infectious material \(OPIM\)](#) that may result from the performance of job duties. The determination of occupational exposure is made without regard to use of personal protective equipment (PPE).

Occupational exposure assessment – The process of defining exposure profiles and judging the acceptability of workplace exposures to environmental agents and ergonomic stressors. Environmental agents include chemical, biological and [physical agents](#).

Occupational exposure incident – A specific incidence of eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or [other potentially infectious material \(OPIM\)](#) that results from the performance of job duties.

Occupational injury – Any injury such as a cut, fracture, sprain, contusion, amputation, etc., that results from a work accident or from an exposure involving a single incident in the work environment.

Occupational illness – An abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases, which may be caused by inhalation, absorption, ingestion, or direct contact.

Occupational injury/illness – An occupational injury is a wound or other condition of the body caused by external force, including stress or strain. The injury is identifiable as to time and place of occurrence and member or function of the body affected, and is caused by a specific event or incident or series of events or incidents within a single day or work shift.

An occupational illness is a physiological harm or loss of capacity produced by systematic infection; continued or repeated stress or strain; exposure to toxins, poisons, fumes, etc.; or other continued and repeated exposures to conditions of the work environment over a period of time. For practical purposes, an occupational illness is any reported condition that does not meet the definition of occupational injury.

Occurrence – A problem, concern, failure, malfunction, or deficiency in equipment, process, procedure, or program. It is also any condition or event that adversely affects, or may adversely affect, DOE or contractor personnel, the public, property, the environment, or DOE's mission,

security, or operations. Occurrences are identified as such if they meet the criteria threshold specified in DOE M 232.1-1A (see the [Occurrence Reporting Criteria](#) website). Occurrences are reportable to DOE and are categorized as follows:

- **Operational Emergencies:** Operational Emergencies are defined in [ES&H Manual](#), Chapter 15, "Emergency Preparedness and Management." (Example: environmental plume escapes Sandia-controlled premises.)
- **Significance Category 1:** Occurrences in this category are those that are not Operational Emergencies and that have a **significant impact** on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests. (Examples: fatality, nuclear criticality.)
- **Significance Category R:** Occurrences in this category are those identified as recurring, as determined from the periodic performance analysis of occurrences across a site (i.e., a LIWG team meets quarterly to review ORs and determines whether there are any recurring events. At that time an OR would be submitted.)
- **Significance Category 2:** Occurrences in this category are those that are not Operational Emergencies and that have a **moderate impact** on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests. (Examples: release of beryllium, electrical shocks, and conduit penetration.)
- **Significance Category 3:** Occurrences in this category are those that are not Operational Emergencies and that have a **minor impact** on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests. (Examples: unexpected discovery of energy source, broken wrist, electrical conduit cut and violation of work procedures.)
- **Significance Category 4:** Occurrences in this category are those that are not Operational Emergencies and that have **some impact** on safe facility operations, worker or public safety and health, public/business interests. (Examples: contamination of employee, noncompliant confined space entry and NMED Notice of Violation [NOV].)

Note: The "old" Off Normal and Unusual categories will still be available in the new ORPS for tracking and trending purposes only.

Occurrence management (OM) representative – The OM representative functions as a centralized, corporate service providing overall program direction and coordination for SNL, interacting with DOE/KAO to ensure SNL's compliance with DOE O 232.1A, and providing facility managers/designees with the required training tools and assistance to carry out their responsibilities.

Occurrence reporting – A process for the investigation, analysis, tracking, and reporting of

events. It ensures that the requirements of [DOE O 232.1A](#), *Environment, Safety and Health Reporting*, are complied with and that DOE and SNL management are kept fully and currently aware of all reportable occurrences (see Sandia [Occurrence Management Program](#)). Although the emphasis is on the investigation, analysis, and lessons learned of reportable occurrences, it also defines a formalized method for documenting and managing all events and non-routine conditions, whether they are reportable or not. The types of events and conditions that are covered in the occurrence reporting process include emergencies and non-emergencies that affect the environment, safety, health, security, property, and operations at SNL.

Office of Independent Oversight and Performance Assurance (OA) – A Department of Energy (DOE) headquarters (HQ) office that may generate findings answered by a Corrective Action Plan.

Off-normal occurrence – Off-Normal Occurrences are abnormal or unplanned events or conditions that adversely affect, potentially affect, or are indicative of degradation in the safety, safeguards and security, environmental or protection, performance or operation of a facility.

Offsite – Any location that does not satisfy the criteria of Sandia-controlled premises.

Offsite [with respect to packaging and transportation] – Any area within or outside a DOE site to which the public has free and uncontrolled access. Also, any area upon which an operation or activity is conducted on a public highway, as determined by the DOT and/or other jurisdictional state or local government.

Oil – Oil of any kind or in any form including but not limited to fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum, fuel oil, sludge, synthetic oil, mineral oil, or oil refuse. This definition includes used oil as defined in 40 CFR 279.

Oil-handling members of the workforce – Those whom engage in operating and maintaining oil-storage containers or operating equipment related to storage containers, as well as emergency-response personnel.

Oil storage facility – Places where oils, greases, and fuels are stored, transferred, or handled as well as any equipment that uses any of these substances, except DOT-regulated vehicles.

OJT – On-the-job training

OKSO – Office of Kirtland Site Operations (formerly Kirtland Area Office [KAO])

OMR – Occurrence management representative

Offsite [packaging and transportation definition] – Any area to which the public has free and uncontrolled access. Also, any area upon which an operation or activity is conducted on a public highway, as determined by the Department of Transportation and/or other jurisdictional state or local government.

On-the-job training (OJT) – Formal training that is conducted and evaluated in the work environment.

On-the-job training (OJT) Instructor – The OJT instructor is typically a senior craftsman/operator/technician, subject matter expert (SME), or a foreman/supervisor who conducts formal one-on-one training and performance testing. A training course for the OJT instructor should emphasize the "how to" rather than the "why"; however, some "why" should also be included. The OJT instructor is not normally expected to develop training materials, but as an SME he/she should be directly involved in assisting the instructional technologists as they develop and modify these materials. OJT instructors should have a basic working knowledge of the concepts of a systematic approach to training.

On-the-job training six-step process – The primary instructional method used in the OJT training setting is the demonstration-performance method. This method includes the following six steps: preparation, introduction, explanation, demonstration, practice under supervision, review/evaluate/conclude.

Onsite – Any location that satisfies the criteria of Sandia-controlled premises.

Onsite [packaging and transportation definition] – Includes all areas within the confines of any access-controlled, Sandia-controlled premise (e.g., NM, CA, TTR, KTF). For example, all of Kirtland Air Force Base is considered to be onsite for purposes of packaging and transportation, even though some of the area is **not** controlled by Sandia.

Onsite [with respect to packaging and transportation] – Any area within the boundaries of a DOE site or facility to which access is controlled. With respect to packaging and transportation-related operations and activities at SNL, the site-specific definitions of "onsite" are as follows:

- At SNL/NM, "onsite" is considered to include all areas within the boundaries of Kirtland Air Force Base.
- At SNL/CA, "onsite" is considered to include all areas bordered by Vasco Road and Greenville Road that are within Sandia-controlled, DOE-owned property boundaries.
- At TTR, "onsite" is considered to include all areas within the boundaries of the TTR.
- At the Nevada Test Site, "onsite" is considered to include all areas within the boundaries of the Nevada Test Site with the exceptions of Area 23 (mercury) and Area 12 Camp.

- At the Waste Isolation Pilot Plant, "onsite" is considered to include all areas within the fenced (controlled) boundaries at the Waste Isolation Pilot Plant site.
- At KTF, "onsite" is considered to include all areas within the boundaries of the Pacific Missile Range Facility.

On-the-job training (OJT) – Training on project-, site-, and facility-specific tasks (and accompanying knowledge), which is normally conducted, documented, and evaluated (using a qualification card or similar record) under controlled conditions in the facility under the supervision of qualified facility personnel. Examples of tasks for which OJT is provided include operation of equipment, training on [technical work documents \(TWDs\)](#), or other tasks critical to successful completion of a job or project.

OP – An operating procedure (OP) is a document that provides step-by-step instructions for specific operations (normal, postulated abnormal, and emergency operations) to ensure that activities are performed correctly, safely, and consistently. Typically, organizations develop their own OPs for internal use within the organization. OPs may exist as independent documents, unless they describe operations involving hazards which require the development of ES&H SOPs. OPs may not substitute for ES&H SOPs, although they may supplement them.

Open burning – Causing of rapid oxidation of any substance which is not confined in a device having controllable fuel/air mixture capable of achieving nearly complete combustion, and from which combustion products are discharged into the open air without passing through a stack, duct, chimney, or vent. Open burning includes detonation or disposal of explosives, ignition of rocket motors, and other research and development activities.

Open handling of cryogenics – The transfer of cryogenic liquid into open dewars or laboratory apparatus, or poured from open dewars into laboratory apparatus. Personnel may be exposed to splashing and boiling liquids or gases during open handling of cryogenics and may need PPE to be protected from those hazards.

Operability validation – For the purposes of local exhaust ventilation (LEV) at SNL, validate means that the results of a performance test indicate that the LEV equipment met performance criteria at the time of the test.

Operational area – Is an area where workers are routinely exposed to beryllium as part of their work activity. The boundaries of an operational area shall be established based on an upper tolerance limit (UTL 95%,95%) calculated from random representative surface wipe samples exceeding 0.2 micrograms beryllium per 100 square centimeters ($\mu\text{g Be} / 100 \text{ cm}^2$) when beryllium is not from soil accumulation or other natural sources ; or areas the appropriate Division ES&H Team industrial hygienist has determined to be contaminated based on documentation of removable contamination exceeding 0.2 $\mu\text{g Be} / 100 \text{ cm}^2$ from a known beryllium activity ; and/or where a beryllium activity is performed. Laboratory operations that

meet the definition of laboratory use of hazardous chemicals (i.e., beryllium) in 29 Code of Federal Regulation 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories" are exempt from this definition unless the activity being performed meets the definition of a beryllium activity.

Operational Readiness Review (ORR) – An independent, disciplined, systematic, documented, and performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that an activity will be operated safely within its approved safety envelope as defined by the activity safety basis. The scope of the ORR is defined based on the specifics of the activity and the reason for the shutdown as related to a minimum set of core requirements. A graded approach is used in defining the depth of the ORR based on these core requirements. A DOE ORR will be used to verify the adequacy of SNL's ORR and the effectiveness of SNL's preparation for operation.

Operational safety requirements – Requirements that define the operating limits of facility, operation, or activity control parameters for nonnuclear facilities that can pose a risk to the public. Operational safety requirements are included in facility safety documentation.

Operations – All SNL activities, projects, or facilities.

Organic peroxide – An organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

OSHA – Occupational Safety and Health Administration

OSHA-regulated substance – Substances covered by the sections of OSHA regulation [29 CFR 1910](#), *Occupational Safety and Health Standards*, Subpart Z, "Toxic and Hazardous Substances." There are more than 40 substance-specific standards, such as, lead ([1910.1025](#)), inorganic arsenic ([1910.1018](#)), cadmium ([1910.1027](#)), methylenedianiline ([1910.1050](#)), methylene chloride ([1910.1052](#)), formaldehyde ([1910.1048](#)), benzene ([1910.1028](#)), asbestos ([1910.1001](#)). Work involving these substances may require additional requirements as specified in the individual standards. Contact the appropriate [ES&H Team](#) for further information and assistance.

Other potentially infectious material (OPIM) – Includes the following:

- The following human body fluids:
 - Amniotic fluid
 - Cerebrospinal fluid

- Pericardial fluid
- Peritoneal fluid
- Pleural fluid
- Saliva in dental procedures
- Semen
- Synovial fluid
- Vaginal secretions
- Any body fluid visibly contaminated with blood
- All body fluids in which it is difficult or impossible to differentiate among body fluids
- Any unfixed tissue or organ other than intact skin from a living or dead human
- Cell, tissue, or organ cultures that contain human immunodeficiency virus (HIV), hepatitis B virus ([HBV](#)), or hepatitis C virus (HCV)
- Culture mediums or other solutions containing HIV, HBV, or HCV
- Blood, organs, or other tissues from experimental animals infected with HIV, HBV, or HCV
- Instruments, devices, or environmental surfaces contaminated by any of the above

Ototoxic chemicals – Chemical substances identified by the American Conference of Governmental Industrial Hygienists (ACGIH) that have the potential to produce hearing loss or other adverse effects on organs or nerves involved in hearing or balance. ACGIH ototoxic chemicals include:

- Carbon Monoxide
- Lead
- Manganese
- Styrene
- Toluene
- Xylene

Outer container – A container used to store primary container(s) of hazardous waste.

Outside helper – Any individual, other than a driver, whose work includes riding on a motor vehicle outside the cab for the purpose of assisting in transporting or delivering goods.

Outside of the manufacturer's recommendations – Use of equipment, tools, or material that are purchased outside of SNL and used for an unintended purpose or in a manner that exceeds a specified limit. For example, use of an air pressure-driven turbine that is rated at 25,000 revolutions per minute (rpm) by its manufacturer for an experiment requiring 31,000 rpm.

Overpack – An enclosure other than a freight container that protects or facilitates handling of a package, or consolidates two or more packages.

Owner – means the person who owns the facility or part of a facility.

Oxidizer – A chemical other than a blasting agent or explosive as defined in 1910.109(a), that initiates or promotes combustion in other material, thereby causing fire either of itself or through the release of oxygen or other gases.

Oxygen-deficient atmosphere – An atmosphere that contains less than 19.5 percent oxygen by volume, which may result from the release of certain asphyxiating gases or cryogenic fluids (e.g., liquid helium, liquid nitrogen).”

Ozone depletion potential – A numerical value that reflects, using CFC-11 with a base ozone depletion potential of 1.0, on a mass-per-kilogram basis, a substance's potential for depleting the ozone. The ozone depletion potential takes into account such factors as the substance's atmospheric lifetime, its bromine and chlorine content, and how fast it decomposes in sunlight.

P

PAAA Nuclear Safety Rules – Nuclear safety requirements, regulations and procedures known as the [DOE Nuclear Safety Requirements](#). The rules include:

- Title 10 CFR 708, *Criteria and Procedures for DOE Contractor Employee Protection Program* (See CPSR001.2, *Ethics & Ombuds*).
- Title 10 CFR 820, *Procedural Rules for DOE Nuclear Activity*.
- Title 10 CFR 830, *Nuclear Safety Management*, Subpart A, “Quality Assurance” (See CPR 001.3.2, *Corporate Quality Assurance Plan*) and Subpart B, “Authorization Basis” (See CPR400.1.1/MN471001, *ES&H Manual*, Chapter 13, “Hazards Identification/Analysis and Risk Management”).

- Title 10 CFR 835, *Occupational Radiation Protection* (See CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, and the Radiological Protection Program).

P&T – Packaging and transportation

P&TSC – Packaging and Transportation Safety Council

Package – The packaging plus its contents.

Packaging – The container together with any components or material necessary for it to conform to minimum packaging requirements of 49 CFR Chapter I, Subchapter C.

Pails – Pails are generally of the same configuration and style as large-capacity drums, but are usually of thinner material and may have only one expanded body hoop. A bail handle or carrying grip is often provided for handling purposes. A common closure for open-head pails is a lug cover that is crimped in place around the top curl and is removed by lifting the lugs.

Parcel – A single item of waste with an accompanying waste disposal tag and WDDR line item description.

Parenteral Contact – Contact by means of piercing mucous membranes (permucosal) or skin barriers (percutaneous) through such events as needle sticks, human bites, cuts, and abrasions. Parenteral contact also includes penetration of the mucous membrane or skin barrier through pre-existing cuts, abrasions, or otherwise non-intact skin.

Particularly hazardous substance – Includes substances that are "[select carcinogens](#)," "[reproductive toxins](#)," and substances that have a high degree of [acute toxicity](#).

Past waste release site – A potential environmental restoration (ER) site that needs further investigation to determine whether the site meets specific criteria for status as a solid waste management unit (SWMU). Any place where SNL has conducted operations in the past is potentially a past waste release site. However, buildings are not past waste release sites although the land on which a building sits may be a past waste release site.

PCB – (Polychlorinated biphenyls) "PCB" and "PCBs" are chemical terms limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances that contains such substance. They are colorless liquids with d 1.4-1.5. Because of their persistence, toxicity, and ecological damage via water pollution their manufacture was discontinued in the U.S. in 1976.

PCB article – Any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. PCB article includes capacitors,

transformers, electric motors, pumps, pipes and any other manufactured item (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition that have no commercial purpose separate from that of the PCB article.

PCB container – Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles and whose surface(s) has been in direct contact with PCBs.

PCB equipment – Any manufactured item, other than a PCB container or a PCB article container, that contains a PCB article or other PCB equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

PCB item – Any PCB article, PCB article container, PCB container, or PCB equipment, that deliberately or unintentionally contains or has a part of it any PCB or PCBs.

Performance Expectation - The desired condition or target level of performance for each measure (e.g., an OSHA TRCR of 1.25 in calendar year 2007).

Performance Indicators - Objective measures of intended performance in terms of results and outcomes, generally consisting of an objective, measure, and expectation.

Performance Measure - A quantitative or qualitative characterization of performance (e.g., OSHA Total Recordable Case Rate [TRCR]).

Performance Objective - A statement of desired outcome(s) for an organization or activity (e.g., perform work safely).

Performance-oriented packaging – A type of packaging that performs to a specified level of integrity when subjected to performance tests.

Permissible Exposure Limit (PEL) – An exposure limit that is published and enforced by the Occupational Safety and Health Administration (OSHA) as a legal standard. See definitions of "[Permissible Exposure Limit 8-Hour Time-Weighted Average \(PEL-TWA\)](#)" and "[Permissible Exposure Limit-Ceiling \(PEL-C\)](#)."

Permissible Exposure Limit-Ceiling (PEL-C) – An exposure limit published and enforced by the Occupational Safety and Health Administration (OSHA) as a legal standard, which in any 8-hour workshift, shall not be exceeded, except for a time period, and up to a concentration not exceeding the maximum duration and concentration allowed.

Permissible Exposure Limit 8-Hour Time-Weighted Average (PEL-TWA) – A time-weighted

average exposure limit published and enforced by the Occupational Safety and Health Administration (OSHA) as a legal standard, which in any 8-hour workshift of a 40-hour work week, shall not be exceeded.

Permit, confined space entry – A written document that authorizes and controls entry into a [permit-required confined space](#). The permit specifies the hazards of the confined space and outlines the controls required for entry.

Permit requester, confined space – An individual, either the entrant, attendant, or supervisor authorizing entry (SAE), affiliated with a confined space entry activity, who interfaces with SNL/NM industrial hygiene personnel to obtain the appropriate confined space entry permit or nonpermit confined space checklist.

Permit-required confined space (PRCS) – A [confined space](#) that has one or more of the following characteristics:

- Contains or has a potential to contain a [hazardous atmosphere](#).
- Contains a material with the potential to engulf an [entrant](#).
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor that slopes downward and tapers to a smaller cross-section.
- Contains any other recognized serious safety or health hazards.

Person-in-charge (PIC) (Material Handling – Cranes, Hoists, and Forklifts) – The manager or other responsible person (other than the equipment operator) known to be qualified and appointed to be responsible for the safe handling of critical loads.

Personal eyewash unit – A supplementary eyewash that supports plumbed units, self-contained units, or both, as delivering immediate flushing fluid.

Personal protective equipment (PPE) – Devices worn by the worker to protect against hazards in the environment. Respirators, gloves, and hearing protectors are examples.

PHA – Preliminary hazard assessment. (Note: This term is no longer used; see PHS and HA)

PHS – Primary Hazard Screening.

Physical hazard – A chemical for which there is scientifically valid evidence that it is a [combustible liquid](#), a compressed gas, an [explosive](#), a [flammable liquid](#), an [organic peroxide](#), an [oxidizer](#), pyrophoric, [unstable \(reactive\)](#), or [water-reactive](#).

Pinch points – Any point other than the point of operation at which it is possible for a part of the body or clothing to be caught between the moving parts of the machine or auxiliary equipment, or between the moving and stationary parts of a machine or auxiliary equipment.

Placard – A sign affixed to a freight container, motor vehicle, or rail car for the purpose of representing the hazard class or classes of the material contained therein. Placarding requirements are contained in the DOT hazardous material regulations.

Placarded quantities of hazardous material [packaging and transportation definition]:

- For [offsite](#), this is determined by [CPR400.1.1.17/GN470084](#), *Complying With Federal Motor Carrier Safety Regulations*, and [49 CFR, Chapter III](#), *Federal Motor Carrier Safety Administration, Department of Transportation*.
- For [onsite](#), this is determined by the nature of the [hazardous material](#) as specified in [Section 12A](#), “Onsite Packaging and Transportation of Hazardous Material.”

Plan of Action (POA) – The high-level document describing the breadth and prerequisites of an Operational Readiness Review (ORR), the composition of the team performing the review, and the designated startup or restart authority.

Plant and animal pathogens – A microorganism or substance capable of producing a disease in a plant or animal.

Plumbed eyewash unit – An eyewash unit permanently connected to a source of potable water.

PMRF – Pacific Missile Range Facility

Point of operation – The area on a machine where work is actually performed on the material being processed.

Pollutant, water – Defined by the Environmental Protection Agency (EPA) as any physical, chemical, biological, or radiological substance that has an adverse affect on water.

Pollution Prevention – The use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and waste into land, water, and air. For DOE, this includes recycling.

Pollution Prevention Opportunity Assessment (PPOA) – An evaluation documented by Pollution Prevention Program personnel with assistance from a waste generator. A PPOA provides a structured look at a waste-generating process to find ways to minimize waste.

Portable container – A container into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer.

Positioning – A personal positioning system that holds a worker in place while allowing a hands-free work environment.

Post-emergency response – Portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and cleanup of the site has begun. If post emergency response is performed by an employer's own employees who were part of the initial emergency response, it is considered to be part of the initial response and not post emergency response. However, if a group of an employer's own employees, separate from the group providing initial response, performs the clean-up operation, then the separate group of employees would be considered to be performing post-emergency response and subject to post-emergency response, paragraph (q)(11) of [29 CFR 1910.120](#).

Post-start finding – A finding that may be corrected after an activity has begun operations.

Potable Water – Water free from impurities present in quantities sufficient to cause disease or harmful physiological effects. Its bacteriological and chemical quality shall conform to the requirements of the USEPA National Primary Drinking Water Regulations and the regulations of the public health authority having jurisdiction.

Potable water system – Series of pipes and valves (usually underground and running through the walls of buildings) that distribute [potable water](#) throughout a location (e.g., [Sandia-controlled premises](#), City of Albuquerque, and pueblo properties) for drinking and sanitary facilities use.

Potential minor noncompliance, PAAA – Unrelated noncompliances that involve minimal or low safety significance. Potential minor noncompliances are not subject to enforcement action. However, DOE expects SNL to identify and track them to ensure that appropriate corrective action is taken to prevent recurrence and to determine if a group of related potential minor noncompliances indicates a programmatic breakdown that warrants reporting as a potential significant noncompliance.

Potential significant noncompliance, PAAA – Potential significant noncompliances are those that meet safety-significant threshold criteria as defined in DOE-HDBK-1089-95, *Guidance for Identifying, Reporting, and Tracking Nuclear Safety Noncompliances*. The threshold criteria aid in the identification of those potential significant noncompliances that, because of their potential or actual adverse impact to the environment or the health and safety of workers or the public, merit additional management evaluation by both SNL personnel and DOE. The criteria are divided into three areas:

- Programmatic or management deficiencies
- Failure of administrative actions
- Significant occurrences

Potential to release – The ability to release radionuclides into the ambient air under normal operating conditions.

Potentially inadequate safety analysis (PISA) – A situation where the [safety analysis](#) potentially is not bounding or may be inadequate. The safety analysis does not describe the facility and its operations accurately and thus is not fulfilling its intended role, and hence is potentially inadequate.

Note: The development of improved or alternative analysis methodology does not render the existing safety analysis “inadequate” and does not require a [USQD](#).

Power-driven woodworking machine – A fixed or portable machine or tool driven by power and used or designed for cutting, shaping, forming, surfacing, nailing, stapling, wire stitching, fastening, or otherwise assembling, pressing, or printing wood or veneer.

Powered cart – Gasoline or battery-powered (electric) conveyance that is designed and used to transport people or material, but is not designed to be driven on public streets. A cart is not designed to meet the safety specifications of automobiles and does not have all the safety equipment required of automobiles.

PPOA – Pollution prevention opportunity assessment

[POTW](#) – Publicly owned treatment works

PRCS – Permit-required confined space.

Pre-Engineered Production Lifts – A repetitive, production-type lifting operation that is independent of the nature of the load to be lifted. Also, the probability of collision, upset, or dropping is reduced to a level acceptable to the responsible manager by preliminary operation evaluation, specialized lifting fixtures, detailed procedures, operation-specific training, and performance of independent review and approval of the entire process.

Preliminary documented safety analysis (PDSA) – Documentation prepared in connection with the design and construction of a new DOE nuclear facility or a major modification to a DOE nuclear facility that provides a reasonable basis for the preliminary conclusion that the nuclear facility can be operated safely through the consideration of factors such as:

- The nuclear safety design criteria to be satisfied.
- A safety analysis that derives aspects of design that are necessary to satisfy the nuclear safety design criteria.
- An initial listing of the safety management programs that must be developed to address operational safety considerations.

Preliminary hazard classification (PHC) – Each PHA has a corresponding preliminary hazard classification. The preliminary hazard classification documents the consequences (health effects or environmental or property damage) from the unmitigated hazard sources identified in the PHA. The preliminary hazard classification is based on the assumption that an incident involving the hazard will definitely occur.

Preoperational activities – Those activities that need to be performed prior to completion of Operational Readiness Review (ORR) or Readiness Assessment (RA) activities to ensure proper operation of equipment and accuracy of procedures. The following are examples of preoperational activities:

- Equipment calibration
- Laser alignment
- Exhaust/fume hood flow tests
- Interlock systems checkout
- Pressurized leak checks for pneumatic and hydraulic systems
- Other tests required to complete construction

Prerequisites (with respect to the startup and restart process at SNL) – Steps taken before a Operational Readiness Review (ORR) or Readiness Assessment (RA) begins to ensure that a facility is ready to operate. This may refer to phases of the startup process, conditions of the project management plan, specific consent or compliance agreements, or Implementation Plan (IP) status, etc. Prerequisites are identified in the plan of action.

Presence-sensing device – A device designed, constructed, and arranged to create a sensing field or area that signals the machine to deactivate when any part of an individual's body or a hand tool is within such a field or area.


Pressure advisor – The first point of contact for guidance regarding pressure safety issues. Pressure advisors must meet the qualifications and fulfill the responsibilities detailed in the MN471000, *Pressure Safety Manual*. Each center that deals with pressure systems must have

at least one pressure advisor. Pressure advisors are designated via the Pressure Advisor Designation Form; qualification is documented by the Pressure Advisor Qualification Form.


Pressure installer – Personnel responsible for installing, modifying, or procuring pressure hardware without supervision. Pressure installers can also supervise the activities of non-pressure installers who may be performing installation or modification tasks.

Pressure operator – Anyone who uses or operates pressure systems. Pressure operators do not modify or install pressure hardware, with the exception of routine operations such as changing gas cylinders and regulators.

Pressure system – An integrated array of pressure-containing components that operate at a pressure different from atmospheric. Examples of pressure systems include the following:

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- Pressure vessels
 - Vacuum vessels
 - Pressure or vacuum systems assembled from valves, fittings, tubing, components, etc.
 - Cryogenic applications
 - Compressed gases used from gas cylinders or from "house" supplied sources (compressed air/nitrogen/etc.)
 - Other equipment operated at a pressure other than atmospheric.

This includes systems containing any type of fluid-gas(es) or liquid(s). This does not include the following:

- 
- "House"-supplied piping (compressed air, house nitrogen gas, etc.) that is **not** connected for use
 - Compressed air hose reels installed by SNL facilities used for dusting and cleaning operations, standard tire-inflating operations, or for standard pneumatic tool operations
 - Standard heating, ventilation, and air conditioning (HVAC) equipment

Pressure – Any pressure other than ambient atmospheric pressure.

Prestart finding – A finding that must be corrected or addressed before an activity can be started or restarted.

Price-Anderson Amendments Act (PAAA) – This Act provides for nuclear safety rules, which

include the 10 CFR 830 regulations for nuclear facilities and the 10 CFR 835 regulations for radiation protection of workers, the public, and the environment.

Price-Anderson Enforcement Program – Through the Price-Anderson Amendments Act (PAAA), Congress mandated that DOE develop and enforce nuclear safety requirements to minimize the risk to workers, the public, and the environment. In 1993, DOE published its enforcement policy (10 CFR 820, "Procedural Rules for DOE Nuclear Activities," Appendix A), which sets forth DOE's strategy for ensuring contractor compliance with the DOE Nuclear Safety Requirements. In 2006, the Worker Safety and Health Program (10 CFR 851) was published and it requires reporting and enforcement through the DOE Office of Enforcement.

Primary authorized individual – In group lockout situations, a lockout/tagout-authorized person who is responsible for personnel accountability and to ensure that lockout/tagout is properly implemented to protect a group of workers.

Primary container – The container in which waste will remain when it is removed from the generator's satellite accumulation point (SAP).

Primary Hazard Screening (PHS) – The hazard analysis process and the documented output of the process in which one or more people familiar with an operation answer questions posed by the Integrated Safety Management System (ISMS) software, which subsequently identifies the hazards, the major requirements for the identified hazards and controls, and the operation's hazard classification. For example:

- Business occupancy (office)
- Standard industrial hazard (SIH)
- Low
- Moderate
- High
- Accelerator
 - Category 3 nuclear
 - Category 2 nuclear
 - Category 1 nuclear

Sandia does not currently operate any high-hazard industrial operations, or hazard category 1 DOE nuclear facilities.

The PHS is part of every operation's authorization basis. The hazard classification determines if additional analyses and safety documentation are required for the authorization basis.

Primary waste generator – A Member of the Workforce within an organization who is directly responsible for management of radioactive waste or mixed waste. Responsibilities include:

- Ensuring that secondary waste generators are appropriately trained and perform activities in accordance with the Technical Work Documents (TWD) for the project.
- Planning radioactive waste or mixed waste management.
- Ensuring that only allowed items are placed into a waste parcel.
- Ensuring that no prohibited items are placed into a waste parcel.
- Accumulation, packaging, segregation, control, and characterization of radioactive waste or mixed waste.
- Completing and signing SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request form ([website](#)).
- Notifying the department manager about conditions that might result in a nonconformance.

Principal authorized individual – A lockout/tagout-authorized person who oversees or leads a group of workers who perform a similar type of work, such as plumbers, metal workers, carpenters, electricians, steam fitters, mechanics, test technicians, or experimenters.

Principal investigator – The individual primarily responsible for a research project or program.

Prions – Proteinaceous infectious particles that lack nucleic acids. Prions are composed largely, if not entirely, of an abnormal isoform of a normal cellular protein. Known human prion diseases include, but are not limited to, Kuru, Creutzfeldt-Jakob disease, and Mad Cow disease.

Procedure – A set of instructions for specific operations to ensure that activities are performed correctly, safely, and consistently. Procedures may be documented as any of the following:

- A description of [administrative controls](#) for maintaining safe working conditions.
- A matrix that identifies safety and health related hazards, [control measures](#), [personal protective equipment \(PPE\)](#), and monitoring requirements necessary to mitigate exposure to hazards associated with specific activities
- Step-by-step instructions (e.g., a step-action table)

- A checklist
- A flowchart
- A permit or collection of permits

Examples of procedures include, operating procedures (OPs), standard operating procedures (SOPs), administrative procedures, and safe work permits (SWPs).

Process – Any activity involving a [highly hazardous chemical](#) including any use, storage, manufacturing, handling, or the onsite movement of such chemicals, or combination of these activities. For purposes of this definition, any group of vessels that are interconnected and separate vessels that are located such that a highly hazardous chemical could be involved in a potential release is considered a single process.

Process Assessment - Evaluation of performance through examination of the translation of requirements and standards into effective work practices (definition adopted from Contractor Assurance System Description February 2004).

Process (Process Safety Management Standard) – Any activity involving a highly hazardous chemical per paragraph (a)(1) of [29 CFR 1910.119](#) including any use, storage, manufacturing, handling, or the onsite movement of such chemicals, or combination of these activities. For purposes of this definition, any group of vessels that are interconnected and separate vessels that are located such that a highly hazardous chemical could be involved in a potential release is considered a single process.

Process discharge – Any water, which during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product.

Program-managed training – Training that is usually specific to a limited number of facilities or job functions and is typically designed to be taken after initial corporate-managed training is completed. The program owner is responsible for training development, implementation, and maintenance. The line is responsible for student record retention. The Primary Hazard Screening (PHS) process identifies program-managed ES&H training requirements.

Program/project management – The process of managing work activities through individual projects and composite programs, associated work roles, and financial resources.

***Project Safety and Health Plan (PSHP)** –The site safety and health plan is kept onsite and at a minimum includes the following elements, as applicable:

- A safety and health risk or hazard analysis for each activity and operation performed.

- Employee training assignments.
- Personal protective equipment and control measures to be used by employees for each of the activities and operations being conducted.
- Medical surveillance requirements.
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods for maintenance and calibration of monitoring and sampling equipment.
- Site control measures.
 - An emergency response plan for safe and effective response to emergencies, including any necessary PPE and other equipment.
 - Confined space entry procedures.
 - Safety procedures (e.g. LOTO, electrical safety, and pressure safety).

Prompt reporting, PAAA – For enforcement purposes, "prompt reporting" is generally done within 20 calendar days after the PAAA program manager determines that a potentially significant noncompliance exists.

Proof Test – A nondestructive tension test performed to verify construction and workmanship of slings or rigging accessories.

Property – Any item that is government-owned, -leased, -rented, or -borrowed in the custody of SNL. Property also includes nongovernment-owned items when those items require relocation within or from SNL-controlled areas.

Property, controlled – Items that are labeled with a property number.

Property, controlled – See definition of "[uncontrolled property](#)."

Property, uncontrolled – Any non-numbered item that has a value of less than \$1,000 and is not sensitive.

[Protected species](#) – All species that are protected under Federal, State, and local regulations.

Publicly owned treatment works (POTW) – A publicly owned facility that provides treatment of wastewater.

Public road – Any road or street under the jurisdiction of and maintained by a public authority

and open to public travel (e.g., the roads within the boundaries of Kirtland Air Force Base [KAFB] are not public roads).

Purchase order – An order stating terms and conditions to buy certain supplies or services from commercial sources.

PWA – Process waste assessment

Q

Qualified – The satisfactory completion of a training program based on knowledge, skills, and abilities that are necessary for performance of assigned responsibilities.

Qualified Laser Operators – Personnel who work in Class 3b or 4 laser environments and are authorized to energize, align, or maintain these lasers.

Qualified NEPA Reviewer (QNR) – A Member of the Workforce who has completed the required NEPA training, has demonstrated a proficiency in citing existing NEPA documents, and has been designated by the responsible SNL NEPA specialist and the respective division ES&H coordinator to have NEPA application authority.

Qualified person – A person who is knowledgeable, trained, and experienced in the servicing and operation of systems and equipment, the hazards involved, and the safety-related work practices to minimize hazard exposure.

Qualified (person, personnel, worker) – Personnel who are properly trained and knowledgeable about the construction, maintenance, and operation of the electric-powered systems and equipment on which they will work, the hazards involved, and applicable safety-related work practices.

Qualified rigging equipment inspector (QREI) – A qualified person who has completed appropriate training (RGH134) and maintains qualification by performing at least 8 hours of rigging equipment inspections a year and by keeping training up-to-date.

Quarterly Report Coordinator - staff member in ES&H Performance Assurance Department assigned to coordinate preparation of the Corporate ES&H Performance Assurance Quarterly Report.

R

Radiation area – Any area accessible to individuals in which radiation levels could result in an individual receiving a deep dose equivalent in excess of 0.005 rem (0.05 millisievert) in 1 hour

at 30 centimeters from the source or from any surface that the radiation penetrates.

Radiation-generating device (RGD) – Collective term for devices which produce ionizing radiation, sealed sources which emit ionizing radiation, small particle accelerators used for single purpose applications which produce ionizing radiation (e.g., radiography), and electron-generating devices that produce x-rays incidentally.

Radioactive material (DOT) – (1) Any material having a specific activity greater than 70 Bq per gram (0.002 microcuries per gram). (2) Any material or combination of material that spontaneously emits ionizing radiation and having a specific activity of more than 0.002 microcuries per gram ($\mu\text{Ci/g}$).

Radioactive material (occupational protection) – Includes any material, equipment, or system component determined to be contaminated or suspected of being contaminated. Radioactive material also includes activated material, sealed and unsealed sources, and material that emits ionizing radiation.

Radioactive material [packaging and transportation definition]:

- For [onsite](#), transport and occupational-protection purposes, radioactive material includes any material, equipment, or system component determined to be [contaminated](#) or suspected of being contaminated. Radioactive material also includes activated material, sealed and unsealed sources, and material that emits ionizing radiation.
- For purposes of [offsite shipment](#), radioactive material includes (1) any material having a specific activity greater than 70 Bq per gram (0.002 microcuries per gram), and (2) any material or combination of material that spontaneously emits ionizing radiation and has a specific activity of more than 0.002 microcuries per gram ($\mu\text{Ci/g}$).

Radioactive material management area (RMMA) – (1) An area where the reasonable potential exists for radioactive contamination of waste due to the presence of unconfined or unencapsulated radioactive material, or (2) an area that is exposed to radiation beams or other sources of particles (neutrons, protons, etc.) capable of causing activation of waste.

Radioactive source – Radioactive material or equipment containing radioactive material that spontaneously emits ionizing radiation put to some purpose.

Radioactive waste – Any garbage, refuse, sludges, and other discarded material, including solid, liquid, semisolid, or contained gaseous material that requires management for its radioactive content (see [Attachment 19B-1](#), "Release of Non-radioactive Waste").

Radioactive waste generator – Any person or organization generating radioactive waste or causing a material to become radioactive waste intentionally or under unplanned

circumstances. Generators may include: managers, other SNL employees, and contractors who are responsible or potentially may be responsible for the generation and subsequent management of radioactive waste as a part of their occupation or position.

Radiological and Criticality Safety Committee (RCSC) – An SNL committee that reviews radiological and criticality-related operations at nonreactor facilities in Tech Area V.

Radiological area – Any area within a [radiologically controlled area](#) which must be posted as a "[radiation area](#)," "[high radiation area](#)," "[very high radiation area](#)," "contamination area," "high contamination area," or "airborne radioactivity area" per [MN471016](#), *Radiological Protection Procedures Manual* (see [Figure GLO-1](#)).

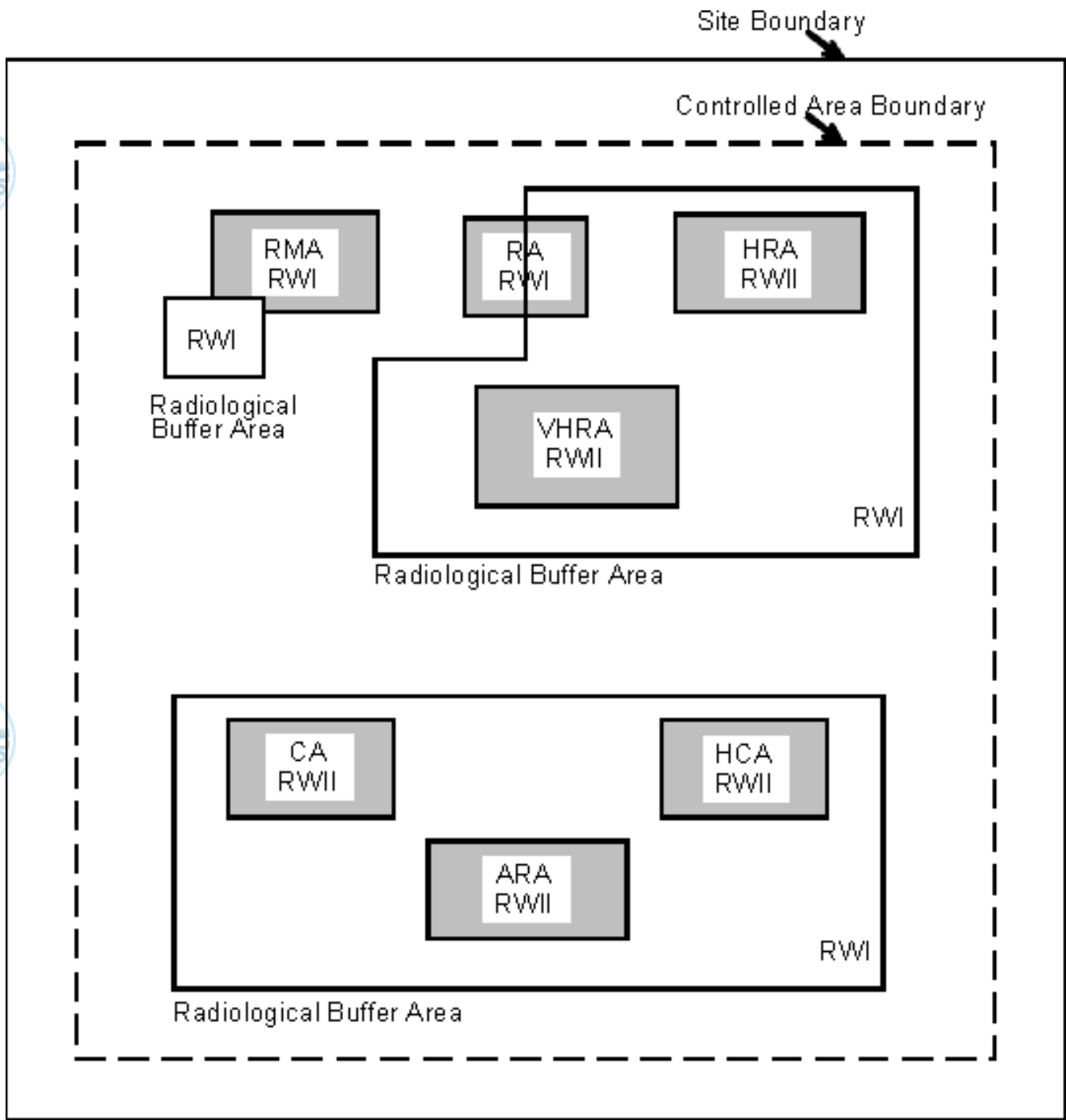
Radiological buffer area (RBA) – An intermediate area contamination reduction zone or transition zone established to prevent the spread of radioactive contamination and to protect SNL personnel from radiation exposure.

Radiological work – Any activity that involves the operation of a radiation generating device, or that involves working with radioactive materials, or that is likely to result in routine occupational exposure above 0.1 rem (0.001 sievert) per year total effective dose equivalent.

Radiological worker – A general employee whose job assignment involves operation of radiation generating devices or working with radioactive materials, or who is likely to be routinely occupationally exposed above 0.1 rem (0.001 sievert) per year total effective dose equivalent.

Radiologically controlled area (RCA) – Any area to which access is managed in order to protect individuals from exposure to radiation and/or radioactive material. Individuals who enter only the controlled area without entering radiological areas are not expected to receive a total effective dose equivalent of more than 100 mrem in a year. See [Figure GLO-1](#).





- HRA - High Radiation Area
- VHRA - Very High Radiation Area
- CA - Contamination Area
- HCA - High Contamination Area
- ARA - Airborne Radioactivity Area

Figure GLO-1. Establishing Controlled and Radiological Areas

Radionuclide NESHAP source – Any radioactive material or process that releases or has a reasonable potential to release radionuclides into the environment through an air emission. NESHAP radionuclide sources may be located at existing facilities or at locations scheduled for new construction. Potential sources include, but are not limited to, any of the following types of

materials and processes:

- Radioactive or activated material, such as:
 - Tritium or tritium waste
 - Fission products
 - Uranium or depleted uranium
- Radiation sources (e.g., neutron sources)
- Accelerators, reactors, or radiation-generating machines
- Glove boxes
- Stored radioactive or mixed waste



Random testing – A process utilizing unscheduled, unannounced drug and/or alcohol testing of randomly selected individuals in testing designated positions, by a process designed to ensure that selections are made in a non-discriminatory manner.

RCRA – *Resource Conservation Recovery Act*



RCT – *Radiological control technician*

Radiological control technician (RCT) – A radiological worker whose primary job assignment involves monitoring of workplace radiological conditions, specification of protective measures, and provision of assistance and guidance to other individuals in implementation of radiological controls.

Reactive (RCRA) – A solid waste that under normal conditions or upon contact with water or corrosives, undergoes violent change or detonation, or generates harmful gases or vapors.

Readiness (with respect to the startup and restart process at SNL) – When the plant, equipment, personnel, procedures, and administrative systems are in place and verified to be at the required state to support operation. A demonstrated capability to proceed to the next program or project phase.



Readiness Assessment (RA) – A Readiness Review that is conducted to determine readiness to startup or restart when the activity has been assigned a hazard category and an Operational Readiness Review (ORR) is not required.

Readiness Review – The independent process conducted to demonstrate that it is safe to

startup new SNL facilities or to restart existing facilities that have been shutdown. Typically, a Readiness Review is either an [Operational Readiness Review \(ORR\)](#) or a [Readiness Assessment \(RA\)](#).

Readiness Review team – A multidisciplinary group that is assembled to judge an activity's "readiness to proceed." Qualification requirements include technical expertise in the area evaluated and experience in conducting assessments, but the members should not be directly responsible for the activity being reviewed. Members may be assigned to the team on a full- or part-time basis. The team does not approve the startup of the activity; they only make a recommendation to the approval authority.

Readiness Review team leader – The leader chosen to be responsible for planning, staffing, and conducting an Operational Readiness Review (ORR) or Readiness Assessment (RA). An ORR or RA team leader is assigned for each ORR or RA after the determination has been made that an ORR or RA is required.

Readiness-to-proceed memorandum – The formal document submitted by the contractor that certifies the conclusion that the activity is prepared to start or resume operations. This document will initiate the DOE Operational Readiness Review (ORR). A small, manageable list of prestart items may exist.

Reasonable suspicion – A suspicion of substance abuse based on specific, articulable observation. Grounds for reasonable suspicion include:

- Sub-standard job performance, such as excessive absenteeism, tardiness, or sub-standard productivity.
- Observable phenomena, such as direct observation of drug use or possession and/or the physical symptoms of being under the influence of a drug.
- A pattern of abnormal conduct or erratic behavior, unusual friction or continual conflicts with co-workers.
- Arrest or conviction for a drug-related offense.
- Identification of an employee as the focus of a criminal investigation into illegal drug possession, use, or trafficking.
- Information provided either by reliable and credible sources including drug-sniffing dogs.
- Independently corroborated or newly discovered evidence that an employee has tampered with a previous drug test.

Recall notice – A memo from the industrial hygiene records contact to managers listing the

pending expiration date for respirator authorization for respirator users in their organization. The notice is accompanied by an attachment entitled "Procedures to Maintain Respirator Authorization," which summarizes how respirator authorization is maintained.

Recipient's commitment – A written response from the receiver of contaminated equipment or other items stating they commit to implementing controls that will prevent foreseeable beryllium exposure, considering the nature of the equipment or item, its future use, and the nature of the beryllium contamination.

Reclaim refrigerant – To reprocess refrigerant to at least the purity required in 40 CFR 82, Subpart F, Appendix A, and to verify this purity using prescribed analytical methods. In general, reclaiming refrigerant in compliance with EPA standards requires using processes or procedures that are available only at a reprocessing or manufacturing facility.

Recombinant DNA molecules – Recombinant DNA molecules are defined as either: (i) molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or (ii) molecules that result from the replication of those described in (i) above. (National Institutes of Health Guidelines For Research Involving Recombinant DNA Molecules, Section 1-B).

Recommendation – An action that would enhance safety by providing assurance beyond the minimum requirements, or otherwise improve the activity.

Recordable Injury/Illness – An injury requiring medical attention such as a prescription, physical therapy, loss of consciousness, work duty restrictions, stitches, lost days (not including day of injury), etc.

Record of Decision – A concise document by a federal agency, based on analysis in an EIS, that discusses an action the agency has decided to take, alternatives considered in reaching a decision to take action, and the impacts to the human environment expected as a consequence of the action.

Recover refrigerant – To remove refrigerant in any condition from an appliance without necessarily testing or processing it in any way.

Recycle refrigerant – To extract refrigerant from an appliance and clean it for reuse without meeting all of the requirements for reclaiming refrigerant. Usually, recycled refrigerant is cleaned using oil separation and one or more passes through a device that reduces the refrigerant's acidity and moisture content and removes particulates.

Regulated air contaminant or pollutant – Any airborne substance, the emission or ambient concentration of which is regulated pursuant to the [New Mexico Air Quality Control Act](#) or the

CAA



- As used in the [Air Quality Control Act \[74-2-1 NMSA 1978\]](#): "air contaminant" means a substance, including any particulate matter, fly ash, dust, fumes, gas, mist, smoke, vapor, micro-organisms, radioactive material, any combination thereof or any decay or reaction product thereof.
- As used in the [CAA, 302.b\(g\)](#) The term "air pollutant" means any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term "air pollutant" is used.

Regulated area – An area demarcated by the responsible employer in which the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the action level (0.2 m g/m³ calculated as an 8 hour Time Weighted Average exposure as measured in the worker's breathing zone).

Reject water – Water that does not meet process standards.

Release – The entrance of a toxic or radioactive material into the air, water, or soil from a source.

Release to the environment, oil – Any amount of oil, grease, or fuel that enters a building drain or reaches the earth or water outside a building wall or secondary containment.

Remote location – A location on Sandia-controlled premises that is not contiguous with, and must be geographically remote from all other buildings, processes, or persons.

Removable contamination – Beryllium contamination that can be removed from surfaces by nondestructive means, such as casual contact, wiping, brushing or washing. This does not include beryllium from natural sources.

Repeat Finding – A finding that has been previously issued for a substantially similar act or condition in the same location, organization, or facility. A repeat finding is to be issued within two years of the previous finding.

Reportable occurrence – An event or condition to be reported in accordance with the criteria defined in [DOE O 232.1A](#).

Reportable quantity – Quantity of material or product compound or contaminant which when released to the environment is reportable to a regulatory agency.



Reproductive toxins – Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Request for Amendment to the Safety Basis – The nominal title given to reports from SNL to DOE documenting the results of the USQ process.

Requester – The individual who requests the purchase of goods or services for SNL by signing a purchase requisition.

Required course – Course that an individual must complete to be in compliance with the ES&H Manual.

Research and development (R&D) activities – R&D activities include scientific experimentation using open burning to prove a concept or produce information useful in planning.

Residual radioactive material(or residual radioactivity) – Any radioactive material that is in or on soil, air, equipment, or structures as a consequence of past SNL or DOE operations or activities.

Respirator – A personal device designed to protect the wearer from the inhalation of hazardous atmospheres.

Respirator laboratory – SNL's central location for procuring, issuing, repairing, sanitizing, and replacing respiratory protection devices. At SNL/NM, this lab is located in the basement of Building 869, room B25.

Respirator, single-use – A single-use disposable respirator, also referred to as a "dust mask," is a device where the body of the facepiece is also the filter. The respirator is held in place by one or two straps, usually nonadjustable, and affords the lowest degree of protection of any type of respirator.


Respiratory Protection Program Administrator (RPPA) – An individual with assigned responsibility and authority for administering the respiratory protection program.

Responsibility – An obligation to take an action, make a decision or satisfy a requirement.

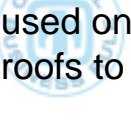
Responsible individual (RI) – The person designated to coordinate the implementation of specific technical requirements contained in a DOE directive.

Responsible organization – The SNL organization formally identified as responsible for

equipment, a process, a system, an area, or a facility, such as an organization that "owns" an occurrence, an appraised organization, or an organization with responsibility for proposed corrective actions.

 **Restart** – Initiation of an activity that had been ongoing but was shutdown for any of the following reasons:


- Unplanned shutdown for operating outside the Authorization Basis.
- Directed by DOE because of safety or other concerns.
- Directed by SNL management because of safety or other concerns.
- Because of changes to hazards or activities resulting in a higher hazard categorization.
- Because of a move to another location.
- Any other cause resulting in an extended shutdown greater than 1 year.

 **Restraint (Tether System)** – A combination of equipment which prevents a user from reaching a point where a fall could occur from an elevated work surface. Restraint systems should be used only when there is no possibility of falling at any angle of restraint (i.e., lifelines used on roofs to prevent a user from falling over the edge). This is for a free fall distance of zero feet.

Retrieval apparatus (or system) – A rescue equipment system used for non-entry rescue of persons from confined spaces. It includes a retrieval line that connects to an [entrant](#) by means of a chest or full-body harness, or wristlets, if appropriate. The retrieval line is secured at the other end to either a lifting (wincher) or other retrieval device or to an anchor point located outside the entry portal (tripod).

Rigging – Hardware or equipment used to safely attach a load to a lifting device. The art or process of safely attaching a load to a hook by means of adequately rated and properly applied slings and related hardware.

Risk – The quantitative or qualitative expression of the possible loss that considers both the probability that a hazard will cause harm and the consequences of the event.

 **Risk Group 1 (RG1) agents** – Agents that are not associated with human disease in healthy adult humans. Refer to Appendix B of Institutional Biosafety Committee (NIH Guidelines For Research Involving Recombinant DNA Molecules) for list of RG1 agents.

Risk Group 2 (RG2) agents – Agents that are associated with human disease which is rarely serious and for which preventative or therapeutic interventions are often available. Refer to Appendix B of Institutional Biosafety Committee (NIH Guidelines For Research Involving

Recombinant DNA Molecules) for list of RG2agents.

Risk Group 3 (RG3) agents – Agents that are associated with serious or lethal human disease for which preventative or therapeutic interventions may be available (high individual risk but low community risk). Refer to Appendix B of Institutional Biosafety Committee (NIH Guidelines For Research Involving Recombinant DNA Molecules) for list of RG3agents.

Risk Group 4 (RG4) agents – Agents that are likely to cause serious or lethal human disease for which preventative or therapeutic interventions are not available (high individual risk and high community risk). Refer to Appendix B of Institutional Biosafety Committee (NIH Guidelines For Research Involving Recombinant DNA Molecules) for list of RG4agents.

RMMA – Radioactive material management area

Role – A status or function performed by a person or group in a particular situation, process, or operation.

Rolling stock – The equipment available for use as transportation, such as automotive vehicles, locomotives, or railroad cars, owned by a particular company or carrier.

Root cause – The cause that, if corrected, would prevent recurrence of this and similar occurrences. The root cause does not apply to this occurrence only, but has generic implications to a broad group of possible occurrences, and it is the most fundamental aspect of the cause that can logically be identified and corrected. There may be a series of causes that can be identified, one leading to another. This series should be pursued until the fundamental, correctable cause has been identified.

Root cause analysis – Any systematic process used to identify the most basic reason(s) for an effect, which if corrected, will prevent occurrence or reoccurrence.

Ross Aviation – An integrated contractor for DOE that operates aircraft in support of SNL operations.

Routine transfer – The transfer of property or material where the packagings and their contents are well defined, multiple or repetitive transfers may be necessary, and the management approvals and procedures are in place to ensure compliance each time a transfer occurs.

Roving personnel – Any Member of the Workforce whose duties require entry into areas with operations controlled by others.

RPPM – *Radiological Protection Procedures Manual*

RWP – Radiological work permit

S

SAE – Supervisor authorizing entry.

Safe facility operation – Operation of a facility in accordance with design requirements and with consideration of the following:

- Potential unnecessary challenges to equipment or personnel (human factors) due to design, operational, or experimental conditions, including potential impact on existing equipment conditions, design limits, and vendor recommendations for equipment operation and maintenance
- Effect of nonsafety-related equipment on the performance of safety-related equipment (e. g., support systems)
- Procedures, operations, tests, experiments, or conditions that place undue burden on personnel in operating, maintaining, or monitoring equipment and that may result in facility or system upset conditions or transients
- Direct or indirect system and component interactions, including immediate or delayed effects
- Possible failure modes and effects
- Possible reduction in reliability, availability, or effectiveness of structures, systems, or components designed to protect the health and safety of workers and public

Safe shutdown – Actions that place the involved process in the most stable, safe condition attainable in order to protect the health and safety of the workers, the public, and the environment.


Safe work permit (SWP) – A [procedure](#) used to control hazards for specific activities. At SNL/NM, SWPs may be used for activities performed only once or that fall outside the scope of existing procedures because of unforeseeable conditions or events. At SNL/CA, SWPs are used to control hazards for one-time operations, short-duration projects, short-term maintenance jobs, decontamination jobs, and proof-of-loss activities that meet certain criteria stated in OP471382, *Administrative Procedure for the Development of Safe Work Permits*. SWPs are not used for emergency or life-saving activities at SNL.

Safety analysis (SA) – A documented review and evaluation of the hazards and risks associated with a proposed activity, process or change. The type, content, and format of a safety analysis document is determined by the preparer and should be graded based on the

activity risk and complexity of the analysis.


Safety Analysis Report (SAR) – A report that documents the adequacy of safety analysis for a facility to ensure that the facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations.

Safety and Security Issues Review Committee (SSIRC) – This Sandia committee provides advisory guidance and recommendations on Nuclear Safety and Worker Safety issues reporting and whether a potential noncompliance should be reported into the DOE Noncompliance Tracking System(NTS) or into the Sandia Safety and Security Local Tracking System. Members include:

- 
- Price-Anderson Amendment Act (PAAA) Coordinator and Alternate
 - Representatives from legal, radiation protection, worker safety and health, weapons SMU, and quality functions
 - RPSC (Radiation Protection Safety Committee) representative

Safety Assessment – An evaluation and risk analysis of a nonnuclear facility to determine its level of risk and the need for a [Safety Analysis Report \(SAR\)](#). A Safety Assessment systematically:

- Identifies the hazards of a facility.
- Describes and analyzes the adequacy of measures taken to eliminate or otherwise control identified hazards.
- Analyzes and evaluates potential accidents and their associated risks.



Safety Assessment Document (SAD) – Document containing the results of a safety analysis for an accelerator facility or one of its constituents. [DOE O 420.2](#), *Safety of Accelerator Facilities*, uses the label "Safety Assessment Document" to distinguish this type of documentation from the [Safety Analysis Report \(SAR\)](#) for nuclear and [high-hazard nonnuclear facilities](#).

Safety basis – Documented safety analysis and hazard controls that provide reasonable assurance that a DOE facility can be operated in a manner that adequately protects workers, the public, and the environment.

- Safety Basis is a subset of the [authorization basis](#)
- Safety Basis is the baseline, point of reference for the USQ process (nuclear facilities).





Safety basis documentation – Safety basis documentation includes the following:

- For nonnuclear moderated hazard and higher facilities, primary hazard screenings (PHSs), hazards analyses (HAs), and additional documents identified in the Integrated Safety Management System (ISMS) software, technical work documents (TWDs), work packages and other work control documents.
- For nuclear facilities, primary hazard screenings (PHSs), hazards analyses (HAs), documented safety analyses, technical safety requirements, safety evaluation reports, approved USQDs, and facility specific commitments made in compliance with DOE rules, orders, and policies. Includes technical work documents (TWDs), work packages and other work control documents.

Safety class structures, systems and components – Structures, systems, or components (SSCs), including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined from safety analyses.

Safety drum vent – A form of pressure relief valve that can be installed into a drum bung port fitting to prevent internal pressure build-up beyond that of the set pressure of the device (typically 5 psig). Some safety drum vents also incorporate other safety features such as flashback arrestors and automatically venting vacuum pressure to assist in product dispensing.

Safety engineering – The engineering disciplines devoted to the application of scientific and engineering principles and methods to the elimination and control hazards.

Safety envelope – The range of conditions covered by the safety documentation of an [operation](#) under which safe operations is adequately controlled.

Safety evaluation report (SER) – A report prepared by DOE to document:

- The sufficiency of the documented safety analysis for a hazard category 1, 2, or 3 DOE nuclear facility.
- The extent to which a contractor has satisfied the requirement of 10 CFR 830, Subpart B, "Safety Basis."
- The basis for approval by DOE of the safety basis for the facility including any conditions for approval.

Note: Might include requirements beyond those in other parts of the safety basis, that is, conditions for approval.

Safety limits – Are the limits on process variables associated with those safety class physical barriers, generally passive, that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive materials.

Safety management program (SMP) – Is a program designed to ensure a facility is operated in a manner that adequately protects workers, the public, and the environment by covering a topic such as: quality assurance; maintenance of safety systems; personnel training; conduct of operations; inadvertent criticality protection; emergency preparedness; fire protection; waste management; or radiological protection of workers, the public, and the environment.

Safety monitoring system – A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Safety platform – A platform intended to provide safe working conditions and designed to be mounted on a high-lift fork truck or other elevating device, providing an area for persons elevated by and working from the platform safety work surface.

Safety review – Verification that a document adequately addresses DOE requirements and regulations and that those aspects of a facility's operation pertaining to safety are adequately addressed. Also referred to as "technical review."

Safety Rules – Nuclear Safety Rules and Worker Safety and Health Program requirements, regulations and procedures known as the [Safety Rules](#). The rules include:

- Title 10 CFR 708, *Criteria and Procedures for DOE Contractor Employee Protection Program* (See CPSR001.2, *Addressing Concerns of Unethical and Criminal Behavior*).
- Title 10 CFR 820, *Procedural Rules for DOE Nuclear Activity*.
- Title 10 CFR 830, *Nuclear Safety Management*, Subpart A, "Quality Assurance" (See CPR 001.3.2, *Corporate Quality Assurance Program*) and Subpart B, "Authorization Basis" (See CPR400.1.1/MN471001, *ES&H Manual*, Chapter 13, "Hazards Identification/ Analysis and Risk Management").
- Title 10 CFR 835, *Occupational Radiation Protection* (See CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, and the Radiological Protection Program).
- Title 10 CFR 851, *Worker Safety and Health Program* (See related chapters in CPR400.1.1/MN471001, *ES&H Manual* and PG470246, Sandia National Laboratories *10 CFR 851 Worker Safety and Health Protection Program [WSHPP]*).

Safety significant structures, systems and components – [Structures, systems, or components \(SSCs\)](#), which are not designated as safety class SSCs, but whose preventive or mitigative function is a major contributor to defense in depth and/or worker safety as determined

from safety analyses.

Safety structures, systems, and components – Both [safety class structures, systems and components](#) and [safety significant structures, systems and components](#).

Sandia approved electrical equipment – equipment that has been built to a design and gone through a formal (records available) design review process and has passed a performance check by a qualified person. A label or 'sticker' should be applied to the equipment and no further evaluation is needed. This meets the intent of having 'approved' equipment.

Sandia contracting representative (SCR) – Also called the buyer, the Sandia contracting representative (SCR) is the procurement professional who acts to fulfill a requester's requirement. Often working in consultation with the requester, the SCR obtains quotations, negotiates and awards contracts, and administers contracts after awards have been made.

Sandia-controlled premises – Real property or buildings (or portions thereof) owned, leased, or withdrawn by or permitted to DOE and designated for Sandia National Laboratories. Includes leased or permitted commercial space (e.g., Research Park in Albuquerque, NM). It does **not** include sites where Sandia National Laboratories performs work but DOE has no legal interest (e.g., a courtesy office provided to a visitor on the premises of a technology transfer partner).

Sandia delegated representative (SDR) – Sandia personnel, specifically called out in the contract, who are authorized to act as official representatives of Sandia, for specific purposes stated in each contract (e.g., approve and accept work, interpret Sandia plans and specifications, inspect work under the contract). A requester who has a specific charge by the [Sandia contracting representative \(SCR\)](#) to monitor the performance of work set by a contract.

Sandia-directed contracts – Those contracts placed with companies that either do not have management expertise and technical capabilities in the areas required by Sandia, or Sandia's needs do not require the companies' management to make appropriate work assignments to ensure satisfactory completion of the job. However, the companies are required to have adequate financial resources to ensure satisfactory completion of the job. Sandia personnel will provide necessary technical direction and assignment and prioritization of work tasks to company personnel. These contracts may include both Staff Augmentation and Contractor Specialist contracts.

- a. Contractor Specialist contracts: those contracts placed with companies that have management expertise, financial resources, and technical capabilities in the area of expertise required at Sandia (i.e.: the companies have established a "market niche" with a significant customer base beyond Sandia). The companies' expertise is sufficient that 1) its management is active in the work performance of individual personnel and capable of providing management oversight and problem-solving for its personnel at appropriate levels of detail of the required work to ensure satisfactory completion of the job; 2)

properly trained and skilled personnel are available to back-fill positions upon turnover or vacation absences; and 3) the companies' personnel assigned to work for Sandia, at Sandia controlled facilities or off-site, are capable of taking direction from Sandia and carrying out their assignments satisfactorily. These contracts may be for full-time support for an indefinite period of time or may be for on-call, as-needed requirements for less than full-time, short periods of time. Demand for the companies' expertise is high, and continued employment of its personnel is not contingent upon contractual relations between Sandia and the company. Contractor Specialist requirements are placed under Sandia-directed contracts.

- b. **Staff Augmentation contracts:** those contracts placed with companies that have management expertise, financial resources, and technical capabilities in the area of personnel recruitment. The companies' expertise is such that 1) its management is not active in the work activities of individual personnel and is not capable of providing problem-solving skills for its personnel at appropriate levels of detail of the required work to ensure satisfactory completion of the job; and 2) the companies' personnel assigned to work for Sandia, at Sandia-controlled facilities or off-site, are capable of taking direction from Sandia and carrying out their assignments satisfactorily. These contracts are typically for full-time support for an indefinite period of time not to exceed three years, but may also include less than full-time work. Staff Augmentation requirements are placed under Sandia-directed contracts.

Sandia Nuclear Criticality Safety Committee (SNCS) – An SNL committee that reviews all criticality-related operations at SNL/NM except for those in Tech Area V.

Sandia ombudsman – A neutral individual at SNL (not an employee or an advocate for management) who offers confidential and informal assistance regarding any work-related issue. The Sandia ombudsman adheres to the National Ombudsman Association's code of ethics and CPS001.2, *Corporate Policy Statement*.

Sandia Reactor Safety Committee (SRSC) – An independent SNL safety committee that reviews safety analyses of moderate or high-risk experiments as well as facility modification proposals and other high-level issues, as defined in the committee's charter, for TA-V reactor facilities.

Sandia Safety Rules Local Tracking System – System for tracking and trending Safety Rules issues and potential noncompliances that do not meet the DOE Noncompliance Tracking System (NTS) reporting threshold. Also referred to as the "Sandia Local Tracking System" managed by the Safety and Security Regulatory Support Office.

Sanitary sewer system – A sewer system to which storm, surface, and ground waters are not intentionally admitted.

Sanitary waste – The portion of liquid effluent exclusive of industrial wastewater and storm water.

Sanitized storage area – An area that has been inspected to ensure the absence of live-fire ammunition and firearms, and which is henceforth governed by a procedure to ensure that live-fire equipment is not subsequently introduced into the area.

SAP – Satellite accumulation point

SAR – [Safety Analysis Report](#)

Satellite accumulation point (SAP) – Every location where hazardous waste is accumulated is at a minimum a satellite accumulation point (SAP). The State of California limits the time allotted for storage of materials at a SAP to one year, and is subject to the requirements of 40 CFR 262.34(c) as interpreted in Chapter 19A, "Hazardous Waste Management," regardless of the type of hazardous waste stored there.

Satellite lockbox – In multi-group lockout situations, a secondary lockbox to which each lockout/tagout-authorized person within a group attaches a personal lock and tag.

Scrap metal – Scrap metal consists of items that can not be used for their intended purpose and that have no value except for their basic material content. Scrap metal could include items such as furniture and equipment that can not be reused, worn or superfluous metal parts or pieces including, but not limited to, structural steel and other metals from decommissioned buildings and facility maintenance activities. Scrap metal includes metals that are clean and metals contaminated or activated with radioactivity and/or contaminated with hazardous substances.

Scrap metal recycling – The melting down of scrap metal by a commercial recycler for use in the form of raw materials to manufacture new products.

Sealed radioactive source – Radioactive material that is contained in a sealed capsule, sealed between layer(s) of nonradioactive material, or firmly fixed to a nonradioactive surface by electroplating or other means. The confining barrier prevents dispersion of the radioactive material under normal and most accidental conditions related to use of the source.

Secondary containment – Any structure or device that has been installed to prevent leaks, spills, or other discharges of stored chemicals, waste, oil, or fuel from storage, transfer, or end-use equipment from being released to the environment. Examples of secondary containment include pans, basins, sumps, dikes, berms, or curbs.

Secondary waste generator – SNL Members of the Workforce whose job assignment involves operations that generate radioactive or mixed waste, or Members of the Workforce who handle

radioactive or mixed waste as long as oversight is provided by a primary waste generator.

Security use of firearms – Use of firearms on [Sandia-controlled premises](#) for security purposes that are defined in the following examples, which include, but are not limited to:

- DOE orders, manuals, and standards:
 - [DOE O 440.1a](#), *Worker Protection Management for DOE Federal and Contractor Employees.*
 - [DOE N 473.1](#), *Carrying Semiautomatic Pistols with a Round in the Chamber.*
 - [DOE O 473.2](#), *Protective Force Program.*
 - [DOE M 473.2-1A](#), *Firearms Qualification Courses Manual.*
 - [DOE M 473.2-2, Chg. 1](#), *Protective Force Program Manual.*
 - [DOE-STD-1091-96](#), *Firearms Safety.*
- CFRs:
 - 10 CFR 1046, *Physical Protection of Security Interest.*
 - 10 CFR 1047, *Limited Arrest Authority and Use of Force by Protective Force Officers.*

Select agents – One of the viruses, bacteria, rickettsiae, fungi, toxins, or recombinant organisms/molecules listed in 42 CFR 72 Interstate Shipment of Etiologic Agents Appendix A.

Viruses

1. Crimean-Congo haemorrhagic fever virus
2. Eastern Equine Encephalitis virus
3. Ebola viruses
4. Equine Morbillivirus
5. Lassa fever virus
6. Marburg virus
7. Rift Valley fever virus



8. South American Haemorrhagic fever viruses (Junin, Machupo, Sabia, Flexal, Guanarito)
9. Tick-borne encephalitis virus
10. Variola major virus (Smallpox virus)
11. Venezuelan Equine Encephalitis virus
12. Viruses causing hantavirus pulmonary syndrome
13. Yellow fever virus

Exemptions: Vaccine strains of viral agents (Junin Virus strain candid #1, Rift Valley fever virus strain MP-12, Venezuelan Equine encephalitis virus strain TC-83, Yellow fever virus strain 17-D) are exempt.



Bacteria

1. Bacillus anthracis
2. Brucella abortus, B. melitensis, B. suis
3. Burkholderia (Pseudomonas) mallei
4. Burkholderia (Pseudomonas) pseudomalei
5. Clostridium botulinum
6. Francisella tularensis
7. Yersinia pestis

Exemptions: Vaccine strains as described in Title 9 CFR 78.1 are exempt.



Rickettsiae

1. Coxiella burnetii
2. Rickettsia prowazekii
3. Rickettsia rickettsii

Fungi

1. Coccidioides immitis



Toxins

1. Abrin
2. Aflatoxins
3. Botulinum toxins
4. Clostridium perfringens epsilon toxin
5. Conotoxins
6. Diacetoxyscirpenol
7. Ricin
8. Saxitoxin
9. Shigatoxin
10. Staphylococcal enterotoxins
11. Tetrodotoxin
12. T-2 toxin



Exemptions: Toxins for medical use, inactivated for use as vaccines, or toxin preparations for biomedical research use at an LD50 for for vertebrates of more than 100 nanograms per kilogram body weight are exempt. National standard toxins required for biologic potency testing as described in 9 CFR Part 113 are exempt.

Recombinant Organisms/Molecules



1. Genetically modified microorganisms or genetic elements from organisms on Appendix A, shown to produce or encode for a factor associated with a disease.
2. Genetically modified microorganisms or genetic elements that contain nucleic acid sequences coding for any of the toxins listed in this Appendix, or their toxic subunits.

Other Restrictions

The deliberate transfer of a drug resistance trait to microorganisms listed in this

Appendix that are not known to acquire the trait naturally is prohibited by NIH "Guidelines for Research Involving Recombinant DNA molecules," if such acquisition could compromise the use of the drug to control these disease agents in humans or veterinary medicine.



Additional Exemptions

1. Products subject to regulation under the Federal Insecticide Fungicide and Rodenticide Act (7 U.S.C. 136 et seq.) are exempt.
2. Additional exemptions for otherwise covered strains will be considered when CDC reviews and updates the list of select agents in this Appendix. Individuals seeking an exemption should submit a request to CDC that specifies the agent or strain to be exempted and explains why, such an exemption should be granted. Future exemptions will be published in the Federal Register for review and comment prior to inclusion in this Appendix.

Select carcinogen – Any substance which meets one of the following criteria:

- It is regulated by OSHA as a carcinogen.
- It is listed under the category, "known to be carcinogens," in the Annual Report on carcinogens published by the National Toxicology Program (NTP)(latest edition).
- It is listed under Group 1 ("carcinogenic to humans") by the International Agency for research on Cancer Monographs (IARC)(latest editions); or
- It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
 - After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m(3).
 - After repeated skin application of less than 300 (mg/kg of body weight) per week.
 - After oral dosages of less than 50 mg/kg of body weight per day.



Self-assessment – An ongoing, multifaceted process that is continually conducted at all levels of a line organization in order to review, evaluate, and improve performance. Examples include management surveillances, walk-arounds, inspections, and other similar activities.

Sensitive habitat – Any defined geographic area, zone, or region supporting the life of sensitive species over some portion of their life cycle. The list of "endangered and threatened species" identifies the respective historic ranges and "critical habitat" designations per 50 CFR

17.95.

Sensitive species – Any animal or plant that is protected by federal or state law or regulation. The principal applicable regulation is 50 CFR 402, *The Endangered Species Act*, which contains lists of "endangered and threatened" mammals, birds, reptiles, amphibians, fishes, snails, clams, insects and plants, both domestic and worldwide. Additional species may be covered by 16 USC 661, *The Fish and Wildlife Coordination Act*.

Sensitizer – A chemical that causes a substantial portion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

Serious – Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received; or results in a fracture of a bone (except simple fractures of fingers, toes, or nose, or a minor-chipped tooth); or damages any internal organ; or causes second- or third-degree burns affecting more than five percent of the body surface.

Services – Contractors' time and effort.

Servicing or maintenance – Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, where Members of the Workforce may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

SGC – The Self Governance Committee is chaired by the chief financial officer and consists of the vice presidents of divisions 1000, 6000, 7000, and 8000, and the directors of centers 4500 and 12800. The SGC partners with DOE and Lockheed-Martin Corporation to establish high-level performance objectives, and ensures that internal assessments (including ES&H) are adequate, cost-effective, and clearly measure SNL's performance.

Shadow force – An armed security force that provides continuing site protection under the constant supervision of a controller while an exercise is being conducted. See [DOE 5480.16A](#) for definitions of firearms-related terms that are not included here.

Shall – Term used to indicate a mandatory requirement.

Sharps, contaminated – Any contaminated object that can pierce the skin, including, but not limited to, the following:

- Broken capillary tubes
- Broken glass

- Disposable razors
- Exposed ends of dental wires
- Hypodermic needles with attached syringes
- IV tubing with attached needles
- Microlancets
- Pipettes
- Scalpel blades
- Surgical instruments
- Suture needles

Sharps, disposable – Any [contaminated sharps](#) intended for single use prior to disposal.


Sharps, reusable – Generally, these are surgical instruments intended for reuse after being suitably decontaminated and steam sterilized.

Shipment – Any **offsite** transportation of hazardous or nonhazardous property or material requiring compliance with DOT regulations. In addition to the actual transportation by any mode of transport, a shipment may include:

- Material identification and verification.
- Packaging.
 - Marking and labeling.
 - Ensuring cargo security.
 - Placarding.
 - Preparing and shipping documents.
 - Tendering the package to the carrier or transporter, as appropriate.

Shipment [packaging and transportation definition] – Any [offsite](#) transportation of hazardous or non-hazardous property or material, by any mode of transport, where either the originating location or the destination for the property or material are beyond the boundaries of a single, contiguous Sandia-controlled premise. In addition to the actual transportation by any mode of transport, a shipment may include the following activities incidental to shipment:

- Material identification and verification.
- Packaging.
- Marking and labeling.
- Ensuring cargo security.
- Placarding.
- Preparing shipping documents.
- Tendering the package to the carrier or transporter, as appropriate.




Shop Crane – A Portable Automotive Lifting Device (PALD), self contained hydraulic and pneumatic-hydraulic crane characterized by a pair of laterally spaced legs, an upright mast, a pivoting boom with a boom extension and hook, and a hydraulic unit. The hydraulic unit moves the boom up and down at a pivot point for the purpose of raising, removing, transporting in the lowered position, and replacing automotive engines, transmissions and other components. Shop cranes have a capacity of 4 tons (8000 pounds) or less.

Should – Term used to indicate recommended, non-mandatory practices.

Signals – Moving signs, provided by workers, such as flagmen, or provided by devices, such as flashing lights, to warn of possible or existing hazards.

Signs – The warnings of hazard, temporarily or permanently affixed or placed at locations where hazards exist.



Simple asphyxiants – A number of inert gases or vapors, when present in high concentrations in air, act primarily as simple asphyxiants by displacing air without other significant physiologic effects. Examples of asphyxiant gases include nitrogen, acetylene, argon, ethane, helium, hydrogen, methane, neon and propylene. Several simple asphyxiants present an explosion hazard. Account should be taken of this factor in limiting the concentration of the asphyxiant.

Site – A specific SNL-controlled area of land upon which SNL controls access and egress, such as those locations in Albuquerque, Livermore, or Tonopah. A site is an area of land that contains a DOE facility or facilities that are either owned or leased by DOE or the federal government. The land may be divided by public rights-of-way.

Site fire marshal – Person appointed by the Corporate Fire Protection Program Manager who meets the minimum requirements as stated in the definition of a qualified fire protection engineer in [DOE O 420.1](#), *Facility Safety*. Site fire marshal activities include ensuring that resources are requested to support corporate and site fire protection programs, that the

Corporate Fire Protection Program is implemented, and that fire protection engineering functions are performed.

Skill-of-the-worker – Those skills SNL personnel should be able to perform commensurate with previous training and/or experience without specific task instruction.

SLP – Sandia Laboratories Policy

Sludge – Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

Small appliance, refrigerant containing – Any appliance on the following list that was fully manufactured, charged, and hermetically sealed in a factory with five pounds or less of refrigerant:

- Refrigerators and freezers designed for home use
 - Room air conditioners
 - Packaged terminal heat pumps
 - Dehumidifiers
 - Under-the-counter ice makers
 - Vending machines
 - Drinking water coolers

SME – A subject matter expert is someone identified by their management as having the knowledge to provide advice on a topic.

SNL/CA – Sandia's primary worksite in Livermore, California.

SNL host – A Sandia employee who acts as the corporate point of contact for a visitor to SNL. An SNL host is accountable and responsible for communicating with the visitor, the visitor's management, if any, and negotiating and making decisions regarding a visitor's activities, needs and requirements during the visit. The SNL host may be, but is not necessarily, the same person who escorts or accompanies the visitor during the visit. The responsibility to escort or accompany a [visitor](#) may be delegated.

SNL/NM – Sandia's primary worksite in Albuquerque, New Mexico, within the boundaries of Kirtland Air Force Base.

SNL/NM Space and Sites Services – Term used to describe SNL organizations that oversee construction contractors at SNL/NM. These organizations include the following:

- Logistics Services Center (7600)
- Facilities Management & Operations Center (7800)

SNL material safety data sheet (MSDS) – An MSDS (see definition of [material safety data sheet \[MSDS\]](#)) that allows a principal investigator at SNL who manufactures or uses a newly developed chemical that is not already documented in an MSDS to communicate associated hazards, and requirements to recipients of the material (excluding test samples unless required by the testing laboratory).

An SNL MSDS can be written, if requested, for any chemical that is not already documented in an existing MSDS to provide SNL employees and contractors with access to hazard information about that chemical.

SNL personnel – SNL employees and contract personnel who are subject to the *ES&H Manual* (see [Section 1B](#), "What is the Scope," "SNL's ES&H Program").

Note: The term "SNL personnel" is used to refer to both employees and employees of contractors to SNL who are required to follow the rules contained in the *ES&H Manual* and should not be interpreted as conferring SNL employee status on contractor personnel. Requirements in the *ES&H Manual*, as they pertain to contractor personnel, are administered through and are governed by the terms of the subject contract.

Soil contamination area – An area about which the following are true:

- The area has not been released for unrestricted use.
- Radioactive material contamination exists in a matrix (e.g., soil) at levels that exceed natural background.

Solid waste – Per 20 NMAC 9.1, any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities, but does not include:

- Drilling fluids, produced waters and other non- domestic wastes associated with the exploration, development or production, transportation, storage, treatment or refinement of crude oil, natural gas, carbon dioxide gas or geothermal energy;

- Fly ash waste, bottom ash waste, slag waste and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels and wastes produced in conjunction with the combustion of fossil fuels that are necessarily associated with the production of energy and that traditionally have been and actually are mixed with and are disposed of or treated at the same time with fly ash, bottom ash, boiler slag or flue gas emission control wastes from coal combustion;
- Waste from the extraction, beneficiation and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore, coal, copper, molybdenum and other ores and minerals;
- Agricultural waste, including, but not limited to, manures and crop residues returned to the soil as fertilizer or soil conditioner;
- Cement kiln dust waste;
- Sand and gravel;
- Solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, 33 U.S.C. Section 1342, or source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, 42 U.S.C. Section 2011 et seq.;
- Densified-refuse-derived fuel; or
- Any material regulated by Subtitle C or Subtitle I, 42 U.S.C. Section 6901 et seq., except petroleum contaminated soils, of the federal Resource Conservation and Recovery Act of 1976, substances regulated by the Federal Toxic Substances Control Act, 7 U.S.C. Section 136 et seq., or low-level radioactive waste.

Solid waste management unit (SWMU) – Any discernible unit at which solid waste has been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid waste has been routinely and systematically released.

Source Material – Uranium or thorium, or any combination thereof, in any physical or chemical form; or ores that contain by weight one-twentieth of one percent (0.05%) or more of (i) uranium, (ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material. [Source: 10 CFR Part 40.]

Source owner – An SNL organization manager who owns a material or process that releases or has the potential to release radionuclides into the environment through an air emission.

The term **source owner** also refers to an SNL organization manager designated to represent

and report actual and potential radionuclide releases for other source owners residing at the same facility.

Space, corporate – Space that is not assigned to an organization. Examples include unassigned space accessible to all employees (halls, stairs, bathrooms, corporate conference rooms, etc.); space removed from the assignable pool for renovation or demolition; and space available for immediate reassignment.

Space/equipment owner – An organization owner who has the authority to act as space owner if he or she has equipment in a space owned by a maintenance organization.

SPCC Plan – This Spill Prevention Controls and Countermeasures (SPCC) Plan has been prepared for SNL/NM in partial fulfillment of the requirements of 40 CFR 112, "Oil Pollution Prevention" and 40 CFR 110, "Discharge of Oil." This Plan contains information to assist owners and operators of oil-storage facilities to implement practices that will prevent potential discharges of oil to the environment. Specific design information and facility procedures are not within the scope of this document, however, this Plan does discuss general safety standards and procedures for handling and storing oil.

Special Nuclear Material – Plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which is determined, pursuant to the provisions of section 51 [of the Atomic Energy Act of 1954, as amended], to be special nuclear material, but does not include source material; or any material artificially enriched by any of the foregoing, but does not include source material. [Source: Atomic Energy Act of 1954, as amended.]

Special waste – Waste that includes the following types of [solid waste](#) that have unique handling, transportation, or disposal requirements:

- Treated waste that was formerly characteristic hazardous waste
- Asbestos waste
- Ash
- Infectious waste
- Sludge
- Industrial solid waste
- Spill of a chemical substance or commercial product
- Dry chemicals, which, when wetted, become characteristically hazardous
- Petroleum-contaminated soils

See [Section 19F](#), "Other Waste," for further information.

Specification packaging – A packaging conforming to one of the specifications or standards for packaging in 49 CFR Chapter I, Subchapter C.

Spent Nuclear Fuel – Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. Test specimens of fissionable material irradiated for research and development only, and not production of power or plutonium, may be classified as waste, and managed in accordance with the requirements of this manual when it is technically infeasible, cost prohibitive, or would increase worker exposure to separate the remaining test specimens from other contaminated material.

Spill – Any uncontained release of a hazardous material into the environment, including releases into a secondary containment unit. Spill, release, and leak are synonymous when appropriate (e.g., radioactive material release, gas leak, etc.).

Spill, hazardous – A spill that satisfies one of the following conditions:

- It contains any hazardous chemical defined under [29 CFR 1910.1200](#).
- It contains any of the CERCLA hazardous substances listed in 40 CFR 302 or the EPCRA extremely hazardous substances listed in 40 CFR 355.
- It is contaminated with any listed or characteristic (ignitability, corrosivity, reactivity, or toxicity) hazardous waste defined under the Resource Conservation and Recovery Act (RCRA) (e.g., spent solvents).
- It contains PCBs.
- It contains a radioactive material.

Spill, oil – Any unplanned release of a petroleum product in any amount.

Standard industrial hazard (SIH) – Operations that have hazards of the type and magnitude that are routinely encountered and/or accepted by the public in everyday life, or hazardous materials or operations encountered in general industry in appropriate applications that are adequately controlled by OSHA regulations or one or more national consensus standards (e.g., ASME, ANSI, NFPA, IEEE, NEC), where these standards are adequate to define special safety requirements, unless in quantities or situations that could significantly impact large numbers of people. For equipment to be considered an SIH it cannot have been modified or used outside of manufacturer's specifications.

A SIH classification is used for hazards that can affect **only** the workers involved in a specific activity and should not have the potential to cause injury to collocated workers involved in other activities

Standard industrial hazard (SIH) Review (SR) – An SR for SIH nonnuclear review consists of a checklist used by the line manager to document that the operations are ready for start or restart (e.g., the Primary Hazard Screening [PHS] has been reviewed, all required training has been completed, procedures are current, etc.).

Standard threshold shift – A change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

Standby mode – Operating mode assigned to a facility to temporarily shut it down while allowing it to be occupied again when required.

Startup – Initiation of an activity or operation that has not yet been performed, or will be performed by a new organization.

Statement of work – A comprehensive description of the goods, services, or combination of goods and services for which SNL contracts. The [Sandia contracting representative \(SCR\)](#) uses the statement of work to communicate requirements to potential suppliers.

Stop control – An operator control designed to immediately deactivate the machine.

Storage (RCRA) – The accumulation of hazardous waste in a RCRA-permitted storage facility for subsequent transfer, treatment, or disposal.

Storm water – Water runoff from rainfall or snowmelt, including that discharged to the sanitary sewer system.

Storm water drainage system – A system designed to collect storm water runoff and remove it from the facility. This system can be comprised of open channels, such as streams, washes and arroyos; drainage features, such as curb gutters; and impoundments or underground pipes.

Strategic contracting – The concept of negotiating the precise statement of goals and the required resources to achieve those goals before making commitments to attain the goals.

Strategic objectives – The eight major areas that SNL will pursue for the next 10-15 years in terms of [mission objectives](#) (whats) and [operational objectives](#) (hows).

Strong/tight packaging – Packaging that provides protection against the unintentional release of its contents under conditions normally incident to transportation. Strong/tight packaging has

the following characteristics:

- The external surface is free from protruding features as far as practicable.
- The outer packaging does not have pockets, indentations, or crevices where water might collect, as far as practicable.
- The packaging has no cuts, dents, abrasions, etc. that would significantly alter the integrity of the package.
- The packaging is firmly sealed with tape, nails, bolts, screws, etc., as appropriate, to control the contents during transport.
- The packaging does not exhibit stains or discoloration that indicates leakage or previous leakage of the contents.

Strong/tight packaging [packaging and transportation definition] – Packaging that provides protection against the unintentional release of its contents under conditions normally incidental to transportation. Strong/tight packaging typically includes fiberboard boxes or drums, metal drums, or wooden crates, and has the following characteristics:

- The external surface is free from protruding features, as far as practicable.
- The outer packaging does not have pockets, indentations, or crevices where water might collect, as far as practicable.
- The packaging has no cuts, dents, abrasions, bulges, etc., that would significantly alter the integrity of the package.
- Open access ports of the packaging are closed and then firmly sealed (e.g, with tape, nails, bolts, or screws), as appropriate, to control the contents during transport.
- The packaging does not exhibit stains or discoloration that would indicate leakage or previous leakage of the contents.
- The packaging includes sufficient inner packaging to secure and protect the contents and to absorb moisture.

Subject matter expert – See definition of "[SME](#)."

Subsite – A geographical region within the SNL/NM site, including the incorporated buildings and physical infrastructure, defined for the purposes of managing facilities and related services. As of 5/15/97 there are three subsites.

Subsite managers – Managers who act as the agent of the corporate landlord (Vice President,

Laboratories Services Division). Their responsibilities include building and infrastructure management and space occupant responsibilities for ES&H in corporate space and exterior space permitted to or controlled by SNL/NM.

Substance abuse – The use of controlled substances, drugs, or alcohol in violation of any state or federal law, including, ingestion to the point of individual impairment or exceeding the legal limits of state or federal laws.

Substance, chemical – A substance obtained by a chemical process or used for producing a chemical effect. A hazardous chemical means any chemical which is a [physical hazard](#) or a [health hazard](#).

Supermoderators – In the [NCS Program](#), materials that can, in certain environments, provide neutron moderation or slowing down that is more effective than water. Supermoderators include materials such as polyethylene, oil, heavy water, beryllium, and carbon.

Supervisor authorizing entry (SAE) – A person who has the responsibility of delegating and overseeing the work activities of others. Also referred to as the entry supervisor, this designation may include, but is **not** limited to, the foreman or crew chief. The entry SAE:

- Determines if acceptable entry conditions are present at a permit-required space (PRCS) where entry is planned.
- Authorizes entry and overseeing entry operations.
- Terminates entry when appropriate.
- Ensures that all practices, procedures, and safeguards are in effect before and during entry operations.

An SAE also may serve as an attendant or entrant as long as that individual is properly trained and equipped. All pertinent requirements relating to the duties of [attendants](#) and [entrants](#) would still apply to the SAE who serves as an attendant or entrant. The SAE is typically selected by the department manager or cognizant line management representative.

Surface discharge – Spilling, leaking, pumping, pouring, emitting, emptying, or dumping into water or in a location and manner where there is a reasonable probability that the discharged substance will reach surface or subsurface water.

Surface spills – Spillage during dispensing or overflows due to overfilling or product expansion.

Suspend work – The act of temporarily pausing or interrupting work in progress to consider and resolve environmental, safety, and health issues or concerns.

Suspect/counterfeit items or material (S/CI) – An item when visually inspected or tested indicates that it may not conform to established government or industry-accepted specifications or national consensus standards or documentation, appearance, performance, material, or other characteristics may have been misrepresented by the supplier or manufacturer. A counterfeit item is one that has been copied or substituted without legal right or authority or whose material, performance, or characteristics have been misrepresented by the supplier or manufacturer.

Items that do not conform to established requirements are not normally considered S/CIs if nonconformity results from one or more of the following conditions (which must be controlled by site procedures as nonconforming items):

- Defects resulting from inadequate design or production quality control.
- Damage during shipping, handling, or storage.
- Improper installation; deterioration during service.
- Degradation during removal.
- Failure resulting from aging or misapplication.
- Other controllable causes.

SWHAS – Sandia Workplace Hazards Awareness System

SWP – Safe work permit

Systemic factors – Those interdependent activities or elements that interact in an orderly arrangement, one in relation to another, to facilitate the desired performance of a major activity or organization.

T

TAC – Toxic air contaminant

Tags – Temporary signs, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

Tagout – Application of an SNL-standardized danger tag (without a lock) on an [energy source isolating device](#) when the device is impossible to lock out. When using tagout, another energy-isolation step, such as removing the wire from a circuit breaker, blocking a flange connection, or disconnecting a pipe in a pressurized system must be performed.

Tagout device – A prominent warning device, such as a tag, with a means of attachment that can be securely fastened to an energy-source-isolating device in accordance with an established procedure to indicate that the energy-source-isolating device and the equipment being controlled shall not be operated until the tagout device is removed.

Tailoring – Process of evaluating the appropriateness and adequacy of requirements and standards at the program level and at the work activity/facility level. Requirements and standards **identification** is generally associated with work planning documents. Requirements and standards **tailoring** is generally associated with technical work documents (TWDs) and work-related training and certifications.

Tank wagon – A portable bulk storage tank.

Task analysis – The systematic process of examining a task to identify skills, knowledge, and/or abilities required for successful task performance.

Technical review – See "[safety review](#)."

Technical safety requirements (TSRs) – The limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a nuclear facility and include, as appropriate for the work and the hazards identified in the documented safety analysis for the facility: safety limits, operating limits, surveillance requirements, administrative and management controls, use and application provisions, and design features, as well as a bases appendix.

Technical standard order (TSO) – The Federal Aviation Administration (FAA) documentation of the airworthiness of commercial off-the-shelf instrumentation.

Technical work documents (TWDs) – A formally approved document used to identify activity-level work [hazards](#) and their associated work [control measures](#). TWDs are developed as part of implementation of the Integrated Safety Management System (ISMS). TWDs provide an [administrative control](#) to communicate to Members of the Workforce the activity-level work hazards and associated work controls during normal activities or foreseeable emergencies. The following are examples of TWDs used at SNL to control hazardous work:

- ES&H standard operating procedures (ES&H SOPs).
- Health and safety plans (HASPs).
- Operating procedures (OPs).
- Safe work permits (SWPs).

- Data packages for pressure and vacuum systems.
- Safety and health programs for hazardous waste operations (HAZWOPER).
- Plans, such as emergency response plans and facility- or building-specific evacuation/emergency plans.

Note: For the purposes of the ES&H Manual, RWP's are **NOT** considered TWDs.

See [Chapter 21](#), "Technical Work Documents (TWDs)," for more information on TWDs.

Test sample – Any chemical shipped to an analytical laboratory located offsite for routine chemical, physical, or structural analysis.

Thermal cutting – A group of cutting processes that severs or removes metal by localized melting, burning, or vaporizing of the workpieces. Commonly known as torch cutting.

Thermal hazards – Material or equipment with contact temperatures approximately below -1° C and greater than 54° C. Potential sources of [thermal hazards](#) could include, but are not limited to, industrial heaters, heat tapes, heat guns, furnaces or ovens, steam lines, cryogenic fluids, and cold surfaces.

Thermal stress – Either cold stress or [heat stress](#).

Thermal stressor – A stimulus that has the potential to increase or decrease the [core body temperature](#) of an individual.

Threshold Limit Value (TLV) – Limit established by the American Conference of Governmental Industrial Hygienists (ACGIH). See the definitions of "[Threshold Limit Value-Ceiling \(TLV-C\)](#)," "[Threshold Limit Value-Time-Weighted Average \(TLV-TWA\)](#)," and "[Threshold Limit Value-Short-Term Exposure Limit \(TLV-STEL\)](#)."

Threshold Limit Value-Ceiling (TLV-C) – The concentration that should not be exceeded during any part of the working exposure.

Threshold Limit Value-Short-Term Exposure Limit (TLV-STEL) – The concentration to which workers can be exposed continuously for a short period of time without suffering from: 1) irritation, 2) chronic or irreversible tissue damage, 3) narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. It is not a separate independent exposure limit; rather, it supplements the time-weighted average (TWA) limit where there are recognized acute effects from a substance whose toxic effects are primarily of a chronic nature.

Threshold Limit Value-Time-Weighted Average (TLV-TWA) – The time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

Tiering – The process of placing one load on or above another.

TLC – Total life concept

Toilet room – A room maintained within or on the premises of any place of employment, containing toilet facilities for use by employees.

Total effective dose equivalent (TEDE) – The sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures). For purposes of compliance with [MN471016](#), *Radiological Protection Procedures Manual*, deep dose equivalent to the whole body may be used as effective dose equivalent for external exposures.

Totally enclosed manner – A manner of using PCBs that results in no PCB exposure to humans or the environment and prevents the spread of PCB contamination to equipment, structures, or other material.

Toxic – A chemical falling within any of the following categories:

- A chemical that has a median lethal dose (LD50) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
- A chemical that has a median lethal dose (LD50) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
- A chemical that has a median lethal concentration (LC50) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

Toxic (California) – Materials that cause acute or chronic illness in humans and other organisms and are regulated by EPA (40 CFR 261.24) or the State of California (22 CCR §66261.24) due to hazards to human health or the environment if improperly managed.

Toxic material – A material in concentration or amount which exceeds the applicable limit

established by a standard, such as [29 CFR 1910.1000](#) and [29 CFR 1910.1001](#) or, in the absence of an applicable standard, which is of such toxicity so as to constitute a recognized hazard that is causing or is likely to cause death or serious physical harm.

Toxicity – The inherent property or ability of a substance to cause injury to biological tissue.

Toxicology – The study of how specific chemicals cause injury to living cells and whole organisms.

Traceability - The ability to verify the history, location, and contents of a [waste parcel](#) by means of recorded identification.

Training – Instruction designed to develop or improve job performance.

Training Coordinator – a) a person granted data input privileges to TEDS, and/or b) a person assigned responsibility for an organization-, program-, or facility-specific set of training tasks (may include determining applicability of SNL training requirements, maintaining training records, developing site-specific training, etc.).

Training & Employee Development System (TEDS) – The SNL corporate training database that tracks training requirements, completions, and out-of-compliances for SNL employees, contractors, and others, as determined by managers.

Training program – A planned, organized sequence of activities designed to prepare individuals to perform their jobs, to meet a specific position or classification need, and to maintain or improve their performance on the job.

Traffic Safety Committee – A standing ES&H committee from SNL/NM that meets monthly to develop and recommend traffic control policies, review projects that impact traffic, and provide for the safe coexistence of all forms of traffic (vehicles, motorized equipment, bicycles, and pedestrians).

Transfer – The relocation of property or material within a DOE site, generally across the access-controlled boundary of a facility. In addition to the actual transportation, a transfer may include the following:

- Identifying and verifying material
- Packaging, marking, and labeling
- Ensuring cargo security
- Placarding

- Preparing the transfer documents, as appropriate
- Changing ownership of or accountability for the item being transferred

A transfer usually requires the assistance of trained personnel from a transportation organization and also requires documentation, such as a move order or move ticket.

Transition plan – The mechanism that formalizes the following prior to Operational Readiness Review or Readiness Assessment:

- Installation and checkout of equipment
- Documentation
- [Administrative controls](#)
- Training of personnel

A transition plan also allows bringing individual elements of a project or activity to preliminary operational status, pending an Operational Readiness Review or a Readiness Assessment of the entire project or activity.

Transport index – The dimensionless number (rounded up to the next tenth) placed on the label of a package of radioactive or fissile material to designate the degree of control to be exercised by the carrier during transportation as defined in [10 CFR 71.4](#). The transport index is determined as the larger of the maximum radiation level in milli-rem per hour at one meter from the external surface of the package or the [Criticality Safety Index \(CSI\)](#) that is obtained as described in [10 CFR 71.59](#). The number of packages allowed on a single shipment is generally limited to those whose sum of TI values is less than 50.

Transportation index (TI) – Synonymous with Transport Index (TI).

Transuranic waste – Radioactive waste containing alpha-emitting radionuclides having an atomic number greater than 92, and a half-life greater than 20 years, in concentrations greater than 100 nCi/g.

Treatability study – A laboratory-scale study designed to treat hazardous or mixed waste by subjecting the waste to a defined treatment process. The treatment process must determine:

- Whether the waste is amenable to the treatment process.
- What pretreatment (if any) is required.
- The process conditions that must be met to obtain the desired treatment.

- The efficiency of the treatment process.
- The characteristics of the residue generated during the treatment process.

Treatment – Any method, technique, or process designed to change the physical and/or chemical nature of the waste so as to render the waste less hazardous; safer to transport, store, and dispose of; amenable for storage; or reduced in volume.

Trench – An excavation that is narrow in relation to its width and depth. Generally the depth is greater than the width.

Trench foot – A condition resembling [frostbite](#) (without freezing) resulting from exposure to cold and wet conditions.

TRU – Transuranic

TSCA – *Toxic Substances Control Act*

TSCA inventory – A list, compiled by the Environmental Protection Agency (EPA), of chemical substances manufactured, imported, or processed in the U.S. for commercial purposes.

TSO – See definition of "[technical standard order \(TSO\)](#)."

TTR – Tonopah Test Range

TWD – See definition of "[technical work document \(TWD\)](#)."

U

Ultrafine particle – In nanotechnology, a particle ranging in size from approximately 0.1 micrometer (100 nanometers) to 0.001 micrometer (1 nanometer).

Unacclimatized – Not adapted to a given temperature extreme.

Unattended forklift – When an operator is 25 feet (7.5 meters) or more away from the forklift, which remains in his view, or whenever the operator leaves the forklift and it is not in his view.

Uncontained chemicals – Chemicals that are not restrained by a container such as a box, a jar, or a bag (e.g., welding rods, raw metals, or solder bars).

Uncontrolled property – Any non-numbered item that has a value of less than \$5,000 and is

not sensitive. Examples of uncontrolled property accepted for reapplication include the following:

- Electronic equipment
- Furniture
- Tools

Uncontrolled release – Is based upon a beryllium risk assessment and determines that equipment release poses no potential risk of exposure to the recipient and no conditions are placed on its future use. Equipment and other items may be released without labels or a recipient's commitment.

Under the control of – Engineering or administrative controls instituted by SNL personnel to ensure the waste is properly managed. Examples of engineering controls include placing physical or access barriers on the waste. Examples of administrative controls include requirements for security, training, or waste management procedures (e.g., [technical work documents \[TWDs\]](#)). Every effort must be made to demonstrate effective control over the temporary storage of waste in [satellite accumulation points \(SAPs\)](#).

Under the control of (California) – The satellite accumulation point (SAP) must be under the control of the operator of the process generating the waste. The SAP must be in the line of sight of the operator(s), or in a locked compartment to which the operator(s) control access, to ensure the operator(s) control management of the accumulated waste to prevent incompatible mixing and other unsafe practices.

Underground oil-storage tank (UST) – A single tank or combination of tanks, including piping that contains an accumulation of regulated substances and holds ten percent or more of its volume (including the volume of the underground pipes connected to it) beneath the surface of the ground.

Underground radioactive material area – Areas shall be established to indicate the presence of underground items that contain radioactive material.

Underground storage tank (UST) – A single tank or a combination of tanks, including underground pipes connected thereto, which are used to contain an accumulation of regulated substances, such as petroleum products, mineral oil, and chemicals, and the volume of which, including the volume of underground pipes connected thereto, is 10% or more beneath the surface of the ground.

Uninterruptible power supply (UPS) – A system that provides power to equipment when normal power is lost.

Universal precautions – An approach to disease control in which all human blood and certain body fluids are treated as if known to be infectious for human immunodeficiency virus (HIV), hepatitis B virus ([HBV](#)), or hepatitis C virus (HCV), or other [bloodborne pathogens](#).

Unknown waste – Waste with an unknown origin or chemical content. Unknown waste presents serious health, safety, and environmental concerns, especially to personnel who handle them.

Unmitigated consequence – When performing a Hazards Analysis (HA), the consequence has **not** been diminished or moderated in intensity or severity. Example: an unmitigated consequence would be the "worst case scenario" or bounding consequence, with no barriers or controls in place.

Unprotected side or hole – No protection from falling (i.e., no guardrail or parapet at least 39" tall).

Unreviewed Safety Question (USQ) – A situation where:

- The probability of the occurrence or the consequences of an accident or the malfunction of equipment important to safety previously evaluated in the [documented safety analysis](#) could be increased.
- The possibility of an accident or malfunction of a different type than any evaluated previously in the documented safety analysis could be created.
- A margin of safety could be reduced.
- The documented safety analysis may not be bounding or may be otherwise inadequate.

Unreviewed safety question determination (USQD) – The final step of the [USQ process](#). A determination whether a proposed activity, process, or change is within the safety basis authorization as described by DOE-approved documents for the subject facility (i.e., the documented safety analysis and [technical safety requirements](#)). Positive USQDs (i.e., the proposed activity/[modification](#) is outside the safety basis authorization) must be forwarded to DOE for approval. Negative USQDs may be approved by SNL.

Unreviewed safety question (USQ) process – The mechanism for keeping a safety basis current by reviewing potential USQs, reporting USQs to DOE, and obtaining approval from DOE prior to taking any action that involves an unreviewed safety question.

Unusual occurrence – An Unusual Occurrence is a non-emergency occurrence that exceeds the Off-Normal Occurrence threshold, is related to safety, safeguards and security, environmental or health protection, performance or operation of a facility. Unusual Occurrences

require immediate notification to DOE.

Unstable (reactive) – A chemical which is the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure, or temperature.

Used container – Drum, barrel, tank, or other container that could have held flammable material or any substances, such as greases, tars, acids, or other material, which when subjected to heat, might produce flammable or toxic vapors.

Used oil – Any oil that has been refined from crude oil or any synthetic oil that has been used and as a result of such use is contaminated by physical or chemical impurities.

Used oil generator – Any person, at SNL/NM whose act or process produces used oil or whose act first causes used oil to become subject to regulation.

Used oil aggregation point – Any site that accepts, aggregates, and/or stores used oil collected only from other used oil generation sites owned or operated by SNL/NM from which used oil is transported to the aggregation point in shipments of no more than 55 gallons.

UST – Underground storage tank

Utility gloves – Non-disposable gloves designed for multiple uses and are capable of being decontaminated (i.e., canvas, leather, rubber, etc.).

V


Validation of corrective action effectiveness – A process for evaluating the effectiveness of each corrective action for correcting the identified problem and preventing reoccurrence of the event.

VDT – Video display terminal

Vehicle – Any mechanically or electrically powered device used to transport people or property on land (e.g., cars, trucks, buses, motorcycles). This classification specifically excludes powered carts, bicycles, snowmobiles, and special-use equipment (construction equipment, vehicles operated on rails, road building machinery, farm tractors, etc.)

Verification – Management verification that the required actions were completed consistent with the description in the corrective action plan (CAP).

Verification of corrective action completion – A process for reviewing the evidence of



completion for each corrective action and ensuring that the actions identified in the corrective action plan are complete.

Very high radiation area – Any area accessible to individuals in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (five grays) in one hour at one meter from a radiation source or from any surface that the radiation penetrates.

Visitor – An individual that performs work or requires access to an area at SNL who is not identified as a Sandia employee or Sandia contractor.

VOC – Volatile organic compound

Volumetrically contaminated metals – A metal that has radioactivity distributed throughout the entire volume of the metal as a result of site-specific operations or activities as opposed to residing only on the exterior surface.



VP – Vice-president


W

WAC – Waste acceptance criteria

Walk down – A method used by reviewers to step through a procedure to assess its accuracy, effectiveness, adequacy of hazard controls, sequence of steps, and ease of use.

Walk-through – Physical tour of a worksite with the purpose of recognizing industrial hygiene hazards and using professional judgment to determine the need for further assessment. Also referred to by [DOE 5480.10](#) as a "walk-through survey."


Warning – Term used to indicate a potentially hazardous situation that, if not avoided, **may** result in **death or serious injury**.



Warning-line system – A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety-net systems to protect workers in the area.

Waste – A material is considered waste if it meets any of the following criteria: it can no longer be used for its intended purpose or for an investigation purpose (e.g., failure analysis); it is declared waste; or it is discarded, abandoned, or there is an element of discard or abandonment, even if it is still usable. A material that is still in use or intended for legitimate use is not waste.


Waste acceptance criteria – Criteria that define the physical, chemical, and radiological waste characteristics that are acceptable at a storage, treatment, or disposal facility.



Waste addition log – A form which documents the specific composition and quantity of waste when the waste is combined in a primary container with other compatible hazardous waste.


Waste certification official (WCO) – The SNL individual responsible for implementation of [FOP 94-15](#), Waste Certification Program Plan Operating Procedures for the Nevada Test Site. The waste certification official (WCO) has final authority for the SNL Waste Certification Program, with review and approval signature authority for all certification-related documents and procedures.

Waste custodian - A Member of the Workforce within an organization or project who provides oversight of low-level (radioactive) waste management activities within the organization or project. A waste custodian shall be assigned by the manager of a generator organization when an SF 2042-PKE, SNL Process Knowledge Evaluation Form (work file), has been developed by that organization for low-level (radioactive) waste to be disposed at the Nevada Test Site. Waste Custodian responsibilities include:

- 
- Being knowledgeable about both, low-level (radioactive) waste generating activities occurring in the organization or project, and SNL waste management programs.
 - Verifying that low-level (radioactive) waste is properly segregated, characterized, and packaged in accordance with the SF 2042-PKE, SNL Process Knowledge Evaluation Form.
 - The [waste custodian](#) in an organization generating waste shall complete the “NTS Waste Stream Information” section of the DR and sign the DR if the waste is covered by an SF 2042-PKE, SNL Process Knowledge Evaluation Form.

Waste generator (California) – see [Waste custodian](#) and [generator](#).

Waste package – One or more low-level radioactive [waste parcels](#) consolidated into an SNL/NM-certified shipping container.



Waste parcel – When radioactive waste is placed into a labeled waste container it becomes a waste parcel. Radioactive waste characterization is to be done for each waste parcel.

Waste profile – A documented approval by the appropriate [Division ES&H Team](#) environmental representative and the appropriate waste program owner for the disposition of waste in compliance with applicable environmental regulations.

Waste stream – A form or type of waste from similar sources and which has similar physical

and chemical characteristics; types and quantities of radionuclides; handling, packaging, and shipping procedures; characterization method and procedures; and certification method and procedures.

Wastewater – (1) Used water that is to be discarded, such as sanitary sewer effluent from sources such as elimination of human waste, process waters, personal wash water from showers and sinks, or water from any washing operation (for example, washing vehicles, buildings, or equipment) or (2) storm water that was captured in any secondary containment structure regardless of whether that container was designed to or deliberately placed to catch or contain the rain.

Water pollutant – A water pollutant is defined by the Environmental Protection Agency (EPA) as any physical, chemical, biological, or radiological substance that has an adverse affect on water.

Water-reactive – A chemical that reacts with water to release a gas that is either flammable or presents a [health hazard](#).

WCO – Waste certification official

WDDR – Waste Description and Disposal Request

Welding – A joining process that produces coalescence of materials by heating them to the welding temperature, with or without the application of pressure or by the application of pressure alone, and with or without the use of filler metal.

Welder/welding operator – Any operator of electric and gas welding and cutting equipment.

WFO – Work for others

WIPP – Waste Isolation Pilot Plant

Work control document – Formally approved document that establishes work control measures. These include, but are not limited to, technical work documents (TWDS) such as procedures and permits, and work packages for contract and maintenance work.

Work controls – Set of administrative and engineering controls that address the ES&H hazards of the operation.

Work planning document – Formally approved document that establishes work roles, responsibilities, resources, and schedules. These include, but are not limited to, business plans, project plans, and statements of work (SOWs) for contracts.

Work planning process – Identification of tasks, schedules, and costs; evaluation of hazards; and review of adequacy (and updating, as necessary) of control systems that need to be in place prior to performing work. Work planning should be an ongoing activity to accommodate changes and lessons learned.

Work practice controls for bloodborne pathogens – Controls that reduce the likelihood of occupational exposure to SNL personnel by altering the manner in which a task is performed (for example, observing universal precautions and prohibiting recapping of needles by a two-handed technique).

Work unit – A craft or work specialty on a given shift or a work shift during a workday.

Working height – The distance from the walking/working surface to a grade or lower level.

Working surface – Any surface or plane on which [SNL personnel](#) walk or work.

Workplace assessment – Assessment of a workplace to determine if hazards are present or likely to be present, which necessitate the use of [personal protective equipment \(PPE\)](#).

Workplace violence – Any form of the following:

- Written, verbal, or non-verbal threats or gestures that cause another person to fear for their safety or the safety of others.
- Physical confrontations or aggression towards any person(s).
- Threatening, injuring, or attempting to injure self or others.
- Deliberate and wrongful violation, damage, or abuse of company property with the intent to cause harm to self or others.

X

Y

Z



[, Bob Goetsch, rsgoets@sandia.gov](mailto:rsgoets@sandia.gov)



ENVIRONMENT, Safety & HEALTH

Manual

Current Changes

[2006 Change History](#)

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[1998 Change History](#)

[1997 Change History](#)

Administrative Changes Only July 2, 2007



[Attachment 1D-3, "Standing ES&H Committees"](#)

This attachment was revised to:

- **Change:** The Electrical Safety Functional Committee (ESFC) Chair **from** "J. Downs" **to** "Mark McNellis."

[Section 4A, "Working in High-Injury-Potential/Remote Operations"](#)

This section was revised to:

- Under subtopic "Implementing Documents":
 - **Change:** Reference **from** "SNL, PG470218, *Worker Protection Program (WPP)*" **to** "SNL, [PG470246](#), 10 CFR 851 Worker Safety and Health Program Plan (WSHPP)" to reflect recent updates.




[Section 4B, "Electrical Safety Practices"](#)

This section was revised to:

- Under subtopic "Implementing Documents":
 - **Change:** Reference **from** "SNL, PG470218, *Worker Protection Program (WPP)*" **to** "SNL, [PG470246](#), 10 CFR 851 Worker Safety and Health Program Plan (WSHPP)" to reflect recent updates.

[Section 4D, "Pressure Safety Operations"](#)

This section was revised to:

- 
- Under subtopic "Implementing Documents":
 - **Change:** Reference **from** "SNL, PG470218, *Worker Protection Program (WPP)*" **to** "SNL, [PG470246](#), 10 CFR 851 Worker Safety and Health Program Plan (WSHPP)" to reflect recent updates.

June 29, 2007

ESH100.5.3, "Lessons Learned "

Note: (*) Indicates a substantive change.

This document has been revised as follows:



- From *ES&H Manual*, Section 22C, "Lessons Learned" (previous version of this document):
 - ***Change:** Section contents to reflect the new ES&H Corporate Process format.
 - ***Change:** The title of the section to "ES&H Corporate Process: Lessons Learned."
 - **Change:** The SME from "Chris Tolentino" to "Ashley McConnell."
 - ***Move:** The "Applicability" statement to "Process Statement."
 - ***Add:** The process statement under the topic "Process Statement."
 - ***Move:** The requirements under the topic, "Implementation of Lessons Learned, (LL)" to "Responsibilities."
 - ***Add:** Responsibilities for the LL Program Manager, LL Program Coordinators, ES&H Performance Data Analysts, Facility Manager or Designee, Members of the Workforce, and Standing ES&H Committees.
 - ***Add:** Topic, "Process," which includes Sources of Lessons Learned Information.
 - ***Move:** *ES&H Manual*, Section 2E, "Feedback and Improve," listed under "References," in "Related hazards and Activities" to "Associated Documents/Procedures" under "Related Documents."
 - ***Move:** *ES&H Manual*, Section 18C, "Occurrence Reporting," listed under "References," in "Related hazards and Activities" to "Associated Documents/Procedures" under "Related Documents."
 - ***Delete:** *ES&H Manual*, Chapter 22, "Feedback and Improvement Processes," listed under "References," in "Related Hazards and Activities."
 - ***Add:** SNL, PG470248, *ES&H Operating Experience Program Plan*.



June 26, 2007

Chapter 16, "Health, Benefits, and Employee Services"

This section has been revised to:

- Under topic, "Return to Work":
 - ***Change:** The requirement that Sandia employees must meet before returning to work **from**, "Were absent 5 consecutive workdays or 7 consecutive calendar days (8 at SNL/CA)." **to** "Were absent 5 consecutive workdays or 7 consecutive calendar days."

- Under subtopic, "Physician's Certificate of Disability (PCD)":
 - ***Change:** The requirement that Sandia employees must meet regarding a PCD **from**, "For an absence due to injury or illness that lasted 5 consecutive workdays or more or 7 consecutive calendar days, (8 at SNL/CA), Sandia employees shall" **to** "For an absence due to injury or illness that lasted 5 consecutive workdays or more or 7 consecutive calendar days, Sandia employees shall:"

Administrative Changes Only
June 25, 2007

Section 10B, "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties "

This section was revised to:

- **Change:** The subject matter expert from "Joseph V. Guerrero" to "Joseph M. Bonaguidi."
- **Clarify:** The availability of the SNL/SWEIS document on the web.

Administrative Changes Only
June 13, 2007

Section 4N, "Industrial Machine and Portable Power Tool Safety"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- Add: the verbiage, "...where identified" to provide clarity as follows:
"OJT, where identified, is provided to each operator and includes the following topics:
 - Selection.
 - Proper use.
 - Limitations of each industrial machine, portable power tool, or industrial robot system that the operator will use.
 - Site-specific requirements.
 - A demonstration by the operator of its safe use in addition to instructions outlined in Chapter 11, 'ES&H Training.'

Note: See Chapter 11 under the topic, 'Organization-Managed Training,' for further information on the degree of rigor imposed on OJT requirements.

- Machine-use authorization is documented using a form such as SF 2001-AMP, Authorization to Use Machine or Power Tool Equipment in Bldg. ____ (Word file/Acrobat file).
- Formal training procedures are documented, as applicable.

- Operator training and authorization records are maintained until replaced by more current records.”

June 8, 2007

Chapter 23, "Contracted Activities"

Note: (*) asterisk denotes substantive change.

Note: Over 75% of this chapter is either new or has been substantively changed and should therefore be read in its entirety.

The issuance of this new chapter is in response to new regulations promulgated through Title 10, CFR 851, “Worker Safety and Health Program.” The subject matter primarily consists of existing requirements prescribed within Section 4V, "ES&H for Contracted Construction and Construction-Like Activities." Readers should be aware that Section 4V will be cancelled soon after Chapter 23 issuance. A summary of requirement additions and requirement deletions are listed below.

This chapter was created to:

Additions

- ***Add:** On-site Construction Service Contract Process requirements.
- ***Add:** A note to the construction safety requirements, “For Construction and Construction-like activities there is an additional requirement for contracted work over \$250,000. The management of construction requesting organizations shall meet Construction Safety Standing Committee (CSSC) requirements. In addition, plans shall be approved by the CSSC (see Attachment 1D-3, ‘Standing ES&H Committees’).”
- ***Add:** Requirements for “Service and Construction Contracts.”
- ***Add:** Requirements for “Onsite Contracts.”
- ***Add:** Requirements for “ES&H Specifications.”
- ***Add: *Project Safety and Health Plan** - The site safety and health plan is kept onsite and at a minimum addresses the following elements, as applicable:
 - A safety and health risk or hazard analysis for each activity and operation performed.
- Employee training assignments.
- Personal protective equipment and control measures to be used by employees for each of the activities and operations being conducted.
- Medical surveillance requirements.
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.
- Site control measures.

- An emergency response plan for safe and effective responses to emergencies, including any necessary PPE and other equipment.
- Confined space entry procedures.
- Safety procedures (e.g. LOTO, electrical safety, and pressure safety).

Deletions

- ***Delete:** Requirements pertaining to “Managing Contractor-Directed Contracts.”
- ***Delete:** The following requirements for “Project Safety and Health Plans”:

“A provision for properly revising and re-submitting the Project Safety and Health Plan to the SDR if any of the following occur:

- Repeated ES&H performance deficiencies are identified during the project.
- Changes in operations or personnel which impact project safety management, as determined by the SDR or designee.
- New activities are introduced that significantly diverge from the original scope of the Project Safety and Health Plan
- New physical, health, or environmental hazards are introduced to the project that significantly affects worker safety and health.

The SDR shall perform one of the following before work begins and prior to initiating major changes required during the project:

- Note deficiencies, omissions, or errors with the Project Safety and Health Plan.
- Notify Contractor of deficiencies, omissions, or errors and request Contractor re-submittal of Project Safety and Health Plan.
- Review and approve the Project Safety and Health Plan.”

- ***Delete:** The required source documents:

- 10 CFR 850, *Chronic Beryllium Disease Prevention Program*.
- “DOE, DOE Acquisition Regulation (DEAR) 970-5204-2, *Integration of Environmental, Safety and Health Into Work Planning and Execution*.
- DOE-STD-1149-2002, *Safety & Health Program for DOE Construction Projects*.

- ***Delete:** The requirement that “Managers (i.e., Line Manager of the SDR or Requester named on the contract or any other Line Manager specifically named in the contract) shall be responsible for requiring a documented pre-construction meeting and subsequent meetings for major contract changes to discuss the Project Safety and Health Plan, contract performance expectations, and the effects that the work activity and existing operations will have on each other. At a minimum, participants shall include:

- Sandia contracting representative (SCR).
- SDR for the requesting organization responsible for the contract.
- Contractor and subcontractor representatives.

- o Division ES&H Team representatives."

**Administrative Changes Only
June 8, 2007**

Attachment 1D-3, "Standing ES&H Committees"

This attachment was revised to:

- **Change:** The Electrical Safety Standing Committee (ESSC) Chair from "Gilbert Herrera" to "David W. Corbett."
- **Change:** The Sandia Nuclear Criticality Safety Committee (SNCS) Chair from "A.O. Bendure" to "Thomas A. Mehlhorn."
- **Change:** The Sandia Radiation Protection Safety Committee (RPSC) Chair from "Anthony Medina" to "Keith M. Matzen."

May 25, 2007

Section 18A, "Reporting ES&H Concerns and Suggestions for Improvement "

Note: (*) asterisk denotes substantive change.

This section was revised to:

- Under the topic "DOE Worker Protection Poster" and under subtopic "Requirements":
 - o ***Change:** The requirement **from** "ES&H coordinators shall post the appropriate DOE worker protection poster for information and reporting processes (i.e., "Worker Protection for DOE Contractor Employees") where it is accessible to Members of the Workforce and visitors" **to** "Senior Managers shall ensure that the appropriate DOE worker protection poster for information and reporting processes (i.e., "Worker Protection for DOE Contractor Employees") is conspicuously posted along major personnel traffic routes in common use areas of buildings. (Some of the people that Senior Managers may enlist assistance from include Building ES&H Coordinators, ES&H Coordinators and Building Managers.) When there is no Senior Manager or Line Manager, coordination is necessary between Facilities and the affected organization(s) to assign a Building ES&H Coordinator or ES&H Coordinator to perform the function."
- Under the topic "References," and under subtopic "Requirements Source Documents":
 - o ***Replace:** The Requirement Source Document, "DOE O 442.1, *Department of Energy Employee Concerns Program*," **with** "DOE O 442.1A, *Department of Energy Employee Concerns Program*," to reflect the current directive listed in Appendix G, "List of Applicable Directives and NNSA Policy Letters."

May 25, 2007

Section 2D, "Perform Work "

Note: (*) asterisk denotes substantive change.

This section was revised to:



- Under topic, "Administrative Duties," and under subtopic, "Information Postings":
 - ***Change:** "Managers shall post the following safety information in a centralized location within each workplace or otherwise make this information accessible to all Members of the Workforce under their direction" **to** "Senior Managers shall ensure that required postings are conspicuously posted along major personnel traffic routes in common use areas of buildings. (Some of the people that Senior Managers may enlist assistance from include Building ES&H Coordinators, ES&H Coordinators, and Building Managers. Building Managers are members of the Facilities organization.) When there is no Senior Manager or Line Manager, coordination between Facilities and the affected organization(s) is necessary to assign a Building ES&H Coordinator or ES&H Coordinator to perform the function. The following safety information must be posted in a centralized location within each workplace or made accessible to all Members of the Workforce under their direction."
 - ***Add:** The "10 CFR 851 DOE Worker Protection Poster," which lists required safety information that managers shall post or make accessible for all MOW.
 - ***Add: *Note:** Not all divisions use building ES&H coordinators. When a building ES&H coordinator has not been appointed for a building or building area, the applicable ES&H coordinator shall be responsible for this requirement."
- Under "References, Requirements Source Documents":
 - ***Add:** "10 CFR 851, *Worker Safety and Health Program*"
- Under topic, "References, Implementing Documents":
 - **Add:** "10 CFR 851, *DOE Worker Protection Poster.*"
- Under topic, "References, Related Documents":
 - **Delete:** "CPR 400.2.13, *Corporate Information Standards*;" this CPR has been cancelled.
 - **Delete:** "CPR400.2.13.14, *Records Retention and Disposition Schedule & Processes*;" this CPR has been cancelled.



May 25, 2007

Section 1D, "Who Does What"

Note: (*) asterisk denotes substantive change.

This section was revised to:



- Note: More than 75% of this section has changed or is new and should be read in its entirety.**
- **Delete:** Throughout the section, reference to organization numbers and replace with the organization names.

- **Delete:** Throughout the section, "Strategic Business Units, (SBUs)."
- ***Move:** The five safety management functions of the "Integrated Safety Management System" (ISMS), and specific roles and responsibilities to Attachment 1D-2.
- Under the topic, "Roles, Responsibilities, Accountabilities and Authorities (R2A2) of Members of the Workforce":
 - **Move:** From the end of "Subject Matter Experts," **Note:** [AOP 04-02](#), *Environmental, Safety and Health (ES&H) and Emergency Management Requirements Management Process*, describes the responsibilities of ES&H functional managers and ES&H and Emergency Management Center SMEs, as well as the requirements flowdown process." **to** the end of "Senior Managers in the ES&H and Emergency Management Center have the following additional R2A2," under the topic, "Management Roles, Responsibilities, Accountabilities and Authorities (R2A2)."
- ***Delete:** Under topic, "Responsibilities of Groups," the subtopic, "Management Councils," and the associated text for the Laboratory Leadership Team and Mission Council.
- ***Move:** From under the topic "Recommended Positions" (now titled "Other Positions"), under subtopic "ES&H Coordinators," the note at the end of the paragraph "Responsibilities and Accountabilities" up to the end of "Requirements" in the same topic and subtopic.
- ***Delete:** Attachment 1D-2, "Summary of ES&H Responsibilities at SNL" and all associated content.
- ***Add:** New Attachment 1D-2, "Integrated Safety Management System (ISMS) Roles, Responsibilities, and Accountabilities and Authorities (R2 A2) at SNL."

Note: This attachment is new and should be read in its entirety.

- ***Delete:** From Attachment 1D-3D – "Standing ES&H Committees," the "Biological/Chemistry Safety Committee (SNL/CA)" and its associated Chair and Purpose.
 - ***Change:** The "Construction Safety Standing Committee Chair" from "Gary Sanders" to "Jeffrey P. Quintenz."
- ***Add:** Attachment 1D-4 – "Operating Process for Standing ES&H Committees."

Note: This attachment is new and should be read in its entirety.

- ***Add:** Attachment 1D-4A – "Sample Nomination Memo for a Standing ES&H Committee Chair."

Note: This attachment is new and should be read in its entirety.

- ***Add:** Attachment 1D-4B – "Standard Format for Standing ES&H Committee Charters."

Note: This attachment is new and should be read in its entirety.

- ***Add:** Attachment 1D-4C – "Sample Memo Requesting Cancellation of a Standing ES&H Committee."

**Administrative Changes Only
May 21, 2007**

Section 6D, "Hazard Communication Standard"

This section was revised to:

- **Change:** the Review Date in the header to indicate that an ES&H Manual self-assessment checklist was completed on April 9, 2007.

Administrative Changes Only May 15, 2007

Section 4K, "Traffic Safety"

This section was revised to:

- Under topic heading "Parking of Government and Construction Contractor Vehicles":
 - **Add:** Guidance that states; "MOW and visitors can use the Sandia National Laboratories Safe Drivers Incentive Guidelines to develop Incentive Programs for their organization."

Section 6G, "Lasers and Intense Light"

This section was revised to:

- **Change:** The California Counterpart **from** "Jamie King" **to** "Ronald Sigurdsson."
- **Change:** The Laser Safety Officer California contact **from** "Jamie King" **to** "Ronald Sigurdsson."

May 10, 2007

Section 4N, "Industrial Machine and Portable Power Tool Safety"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- **Add:** A "Review Date: November 13, 2006," to the header, indicating a ES&H Manual Self-Assessment was completed.
- **Add:** The word "(LOTO)" to the citation of Section 4C, "Lockout/Tagout" throughout the document.
- **Change:** The formatting of reference from "CPR400.1.1.7/GN470037, *Administrative Control Procedure*" to "CPR400.1.1.7/GN470037, '*Administrative Control Procedure*'" throughout the document.
- **Change:** Throughout the parent document, the reference from Section 4C, "Lockout/Tagout and Administrative Control Locking" to "Section 4C, "Lockout/Tagout (LOTO)" and CPR400.1.1.7/GN470037, '*Administrative Control Procedure*.'"
 - Under topic, "Training":
 - ***Change:** The requirement for activities which involve use of industrial machines **from** "On-the Job

Training (OJT) (SNL/NM)" to "On-the-Job Training (OJT) (SNL/NM) or MCH100 (SNL/NM)."

- ***Delete:** The recommendation for activities which involve use of industrial machines, "MCH100 (SNL/NM)."
- ***Change:** The requirement for activities which involve use of portable power tools **from** "OJT (SNL/NM)" **to** OJT (SNL/NM) or MCH100 (SNL/NM).
- ***Add:** A note within the requirement for activities which involve use of portable power tools, "See Chapter 11, 'ES&H Training,' for information on OJT training requirements and procedures."
- ***Delete:** The recommendation for activities which involve use of portable power tools, "MCH100 (SNL/NM)."
- ***Add:** A requirement for activities which involve use of industrial robot systems which states, '**Note:** See Chapter 11, 'ES&H Training,' for information on OJT training requirements and procedures.'
- **Change:** The formatting of the requirements **from** "OJT is provided to each operator, which includes the selection, proper use, and limitations of each industrial machine, portable power tool, or industrial robot system that the operator will use, its site-specific requirements, and a demonstration by the operator of its safe use in addition to instructions outlined in Chapter 11, "ES&H Training," as applicable" **to** a bulleted list.
- **Add:** Guidance for MOW to "See the Safety Engineering Program, Machine Shop Safety website for additional info."

- Under topic, "Establishing a Safe Work Environment":

- **Clarify:** The information to accurately reflect the current practice, **from** "Appropriate operating instructions for the various machines are posted, as presented in the attachments to Section 4N" **to** "Appropriate operating instructions for the various machines are readily available to equipment users, as presented in the attachments to Section 4N."

- Under topic, "Installing Industrial Machines":

- **Change:** The title of the topic **from** "Installing Industrial Machines" **to** "Installation of Industrial Machines."

- Under topic, "Operating Industrial Machines, Portable Power Tools, and Industrial Robot Systems":

- **Clarify:** The information to accurately reflect the current practice **from** "See Section 4A, 'Working in High-Injury-Potential Operations,' for additional guidance" **to** "See Section 4A, 'Working in High-Injury-Potential/Remote Operations,' for additional information."

- Under topic, "Inspections, Maintenance, and Testing":

- ***Change:** The requirement for MOW using industrial machines and industrial robotic equipment (including guards) **from** "Remove damaged or unsafe machines from service and apply LOTO, as appropriate, until they have been repaired or disposed of properly" **to** "Remove damaged or unsafe machines from service and apply administrative controls, as appropriate, until they have been repaired or disposed of properly."
- ***Add:** The requirement for power tools which states, "MOW shall Ensure records are maintained in accordance with the Sandia Records Retention and Disposition Schedule."

- Under topic, "References":

- **Add:** A citation under Related Documents, "ANSI B11.TR3-2000, *Risk Assessment and Risk Reduction – A Guide to Estimate, Evaluate and Reduce Risk Associated with Machine Tools.*"

Administrative Changes Only
May 8, 2007



Chapter 5, "Fire Protection"

- **Change:** Topic title, "Building Evacuation Teams," to "Building Evacuation Information":
- **Add:** Guidance for Members of the Workforce, which states the following, "For information regarding Fire Safety Floor Plans see the *International Fire Code, 2006 Edition*, "[Fire Protection Guidance](#)."

May 8, 2007

Section 4V, "ES&H For Contracted Construction and Construction-Like Activities"

Note: (*) asterisk denotes substantive change.

Note: Over 75% of this section is either new or has been substantively changed and should therefore be read in its entirety.

This section was revised to:

- **Change:** The subject matter expert **from** "Mike Strosinski" **to** "Andrew Zeitler."
- **Change:** The NM SME in the Direct Access Services (DAS) list under the heading "Construction-Like Activities" **from** "Michael Strosinski" **to** "Andrew Zeitler."
- ***Add:** Attachment 4V-3, "Activity Hazard Analysis (AHA) For Construction Instructions."
- ***Add:** Attachment 4V-4, "Activity Hazard Analysis (AHA) For Construction Template."

Administrative Changes Only
April 24, 2007



Section 4J, "Material Handling - Cranes, Hoists, and Forklifts"

This section was revised to:

- Under "Training and Qualifications":
 - **Change:** The citation for operators of miscellaneous lifting devices **from** "Chapter 4 in DOE-STD-1090-2004" **to** "Chapter 16 in DOE-STD-1090-2004."
 - **Add:** The following recommended training for operators of miscellaneous lifting devices:
 - RGH100
 - RGH134



Administrative Changes Only April 23, 2007

Chapter 2, "Cross-Cutting ISMS Elements"

The following administrative changes were made:

- **Change:** The SME **from** "Johnny Vaughan" **to** "Nancy Linarez-Royce" in Chapter 2 and each Section header except 2C.
- **Change:** The CA counterpart **from** "Donn Wright" **to** "Dennis J. Beyer" throughout Chapter 2 and each Section header except 2C.



April 23, 2007

Section 6U, "Hazardous Material (Chemical and Biological) Inventory"

Note : (*) asterisk denotes substantive change.

- **Note:** This document has been altered by more than 75% and should be read in its entirety. Section 6U was revised to:
 - ***Change:** The title of the section **from** "Chemical Barcoding and Inventory" **to** "Hazardous Material (Chemical and Biological) Inventory."
 - ***Change:** The "Applicability" section to include biological materials as well as chemicals.
 - ***Change:** The title of the "Chemical Inventory Responsibilities" topic **to** "Hazardous Material Inventory Responsibilities," and revise requirements for managers of organizations that store or use hazardous materials.
 - ***Change:** The title of the topic "Identify Where Chemicals are Stored" **to** "Identify Where Hazardous Materials are Stored," and change guidance for laboratory owners who are moving an entire laboratory.
 - ***Change:** The title of the topic, "Barcode and Report Chemicals Received" **to** "Barcode and Report Hazardous Materials Received," and change requirements and guidance for Members of the Workforce for barcoding and reporting hazardous materials.
 - ***Change:** The title of the topic, "Report Static Chemical Inventory Information" **to** "Report Static Hazardous Materials Inventory Information," and change requirements for owners of locations that have storage containers.
 - ***Change:** The title of the topic, "Transfer or Removal of Barcoded Chemicals in the CIS Inventory" **to** "Transfer or Removal of Hazardous Materials in the CIS Inventory," and change requirements for Members of the Workforce for transferring or removing hazardous materials from or within the CIS inventory.
 - ***Change:** The title of the topic, "Chemical Inventory Reconciliation" **to** "CIS Inventory Reconciliation," and change requirements for managers of organizations that store or use chemicals.
 - ***Change:** in the topic, "Related Hazards and Activities": the term "chemicals" **to** "hazardous materials"



throughout the topic, except when referring to GN470094, *Handling Chemicals at SNL/CA*, and add two additional hazards/activities with associated references.

- ***Change:** The title of Attachment 6U-1, "Barcoding Chemicals" to "Barcoding Hazardous Materials," and add additional items to the list of "Items that do not Require Barcodes."
- ***Change:** the following titles of forms:
 - SF2001-CII, "Chemical Inventory Incoming Form," to "Hazardous Material Inventory Incoming Form."
 - SF2001-CIT, "Chemical Transfer/Removal Form," to "Hazardous Material Transfer/Removal Form."
- ***Change:** Forms SF2001-BAI, SF2001-CII, and SF2001-CIT to replace "chemical(s)" with "hazardous material(s)" throughout the forms, and add additional instructions for completing the forms.

Administrative Changes Only April 20, 2007

Chapter 1, "Introduction to ES&H"

- **Change:** The SME from "Johnny Vaughan" to "Nancy Linarez-Royce" in Chapter 1 and each Section header.
- **Change:** The CA counterpart from "Donn Wright" to "Dennis J. Beyer" throughout Chapter 1 and each Section header.

April 19, 2007

Section 6I, "Confined Space Entry"

Note: (*) asterisk denotes substantive change.

This section has been revised to:

- **Add:** A review date to the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed for this section.
- ***Delete:** All references to eTWDs and the eTWD tool which has been decommissioned and replaced by the Integrated Work Plan (IWP).
- Under topic, "Applicability":
 - ***Change:** "This document previously applied to SNL/NM only, whereas Section 6T (now archived) applied to SNL/CA. Except where noted, requirements and guidance within this document now apply to confined-space-related activities at all Sandia-controlled premises."
- to**
- "Except where noted, requirements and guidance within this document apply to Members of the Workforce who perform activities in confined spaces at SNL/NM and SNL/CA and all Sandia-controlled premises."
- Under topic, "Training," in subtopic, "Requirements":

- ***Add:** CNF107 to required training for supervisor authorizing entry for SNL/CA.
- **Delete:** CNF107 from recommended training for supervisor authorizing entry for SNL/CA.
- ***Delete:** CNF105 from required training for Design of confined space and Coordination of facility operations work activities for SNL/CA.
- **Add:** CNF105 to recommended training for Design of confined spaces for SNL/CA.
- **Add:** CNF105 and 107 to recommended training for Coordination of facility operations for SNL/CA.
- **Add:** CNF 107 to recommended training for Sandia delegated representatives for SNL/CA.
- ***Add:** CNF107 to required training for Facilities construction representatives for SNL/CA.
- **Delete:** CNF107 from recommended training for Facilities construction representatives.
- Under topic, "Entry into Permit-required Confined Spaces," in subtopic, "Temporary Reclassification on Permit-Required Confined Spaces (PRCSs)":
 - ***Change:** The statement in the note "At SNL/CA, a re-evaluation is performed by industrial hygiene personnel prior to each entry to determine if conditions within the space have changed or if the proposed work within it warrants its re-classification."

to

 - "At SNL/CA, a re-evaluation is performed by industrial hygiene personnel, in consultation with the supervisor authorizing entry (SAE), prior to each entry to determine if conditions within the space have changed or if the proposed work within it warrants its re-classification."- Under subtopic, "Emergency Notification, Response, and Rescue":
 - ***Add:** Note to "Requirements" for Managers in consultation with supervisors authorizing entry:
 - "At SNL/CA, the generic site confined space rescue plan is provided on the permit. The need for a specific rescue plan for an entry will be determined by the industrial hygiene representative and the supervisor authorizing entry at the time permit is issued. Prior to entry, the supervisor authorizing entry or the industrial hygiene representative will notify the LLNL Fire Department Dispatcher, extension 22-7595, to confirm the availability of rescue services."
- Attachment 6I-1, "Sample Signs for Confined Spaces":
 - ***Change:** Emergency Call telephone number on sample Caution and Danger signs for SNL/CA to "294-2222."
- Attachment 6I-2, "Sample Permit Registration Information":
 - ***Change:** Instructions on how to access Corporate Forms to reflect Sandia's current internal web pages to "Select the appropriate Confined Space Form (CSA, CSE or CSG) from the ["ES&H and Environmental Forms"](#) (SF2001 Series)."
 - **Replace:** The section of the table that lists the Confined Space Checklist forms with the current table list.
- Attachment 6I-3, "Sample SNL/CA Forms":
 - ***Change:** To Step IV in the Confined Space Entry Permit **from** "Emergency Rescue Plan: Attendant may perform non-entry rescue using the appropriate rescue equipment. LLNL Fire Dept. provides rescue

requiring actual entry into space. Access rescue services by phone (911 – landline or 294-2222 – cellular) or 2-way radio (Maintenance channel)."

to

- o **"EMERGENCY RESCUE PLAN: Notify LLNL Fire Department Dispatcher, Extension 22-7595 to ensure rescue services availability prior to entry.** Attendant may perform non-entry rescue using the appropriate rescue equipment. LLNL Fire Dept. provides rescue requiring actual entry into space. Access rescue services by phone (911 – landline or 294-2222 – cellular) or 2-way radio."

April 13, 2007

Section 22A, "ES&H Line Self-Assessment (SA) Activities"

Note: (*) asterisk denotes substantive change.

- This document has been altered by greater than 75% and should be read in its entirety. Specifics include:
 - o ***Change:** Roles and responsibilities for all levels of documented Members of the Workforce.
 - o ***Change:** Requirements in the "Define Expectations" section.
 - o ***Change:** Requirements in the "Schedule the Self-Assessment" section.
 - o ***Change:** Requirements in the "Plan the Self-Assessment" section.
 - o ***Change:** Requirements in the "Gather Self-Assessment Data" section.
 - o ***Change:** Requirements in the "Compile and Review Self-Assessment Data" section.
 - o ***Change:** Requirements in the "Develop Corrective Actions" section.
 - o ***Change:** Requirements in the "Report Self-Assessment Results" section.
 - o ***Delete:** Requirements source document; [DOE P 450.5](#), *Line Environment, Safety and Health Oversight*, 6-26-97.

April 12, 2007

Section 13A, "Hazards Identification and Classification Process"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- Under topic "Hazards Identification and Management":
 - o ***Change:** The requirement for Members of the Workforce who direct or supervise day-to-day operations and activities **from** "Know the hazards associated with the work and the controls needed to perform the work safely that are outlined in the [Primary Hazard Screening \(PHS\)](#)" **to** "Know the hazards associated with the work/workspace and the controls needed to perform the work safely that are outlined in the

Primary Hazard Screening (PHS)."

- ***Change:** The requirement for Members of the Workforce who direct or supervise day-to-day operations and activities **from** "Ensure that all required controls are properly in place before work begins" **to** "Ensure that all required controls are properly in place before work begins and during work. "
- ***Add:** The following requirements for managers and Members of the Workforce, when determining controls to mitigate hazards:
 - Eliminate hazards or reduce risk through design.
 - Use the following hierarchy for mitigating hazards:
 1. Passive engineering controls.
 2. Active engineering controls.
 3. Administrative controls.
 4. Personal protective equipment.
 - Implement interim protective measures pending completion of actions to implement final abatement (mitigation) of hazards.
 - Consider the following, when establishing interim controls:
 1. In the interval during which an abatement action is being carried out, interim protective measures are established for identified hazards. Methods such as administrative controls, work practice modifications, or personal protective equipment may used to provide this interim protection. The interim measures selected provide protection that is equivalent to the permanent protection provided by compliance with relevant safety standards.
 2. The determination of priority assigned to the abatement of a specific hazard shall be based on the risk of injury or illness the hazard presents to the worker; however, other factors may be considered, including: regulatory compliance; resources (budget and personnel); complexity of abatement; and mission. In some cases, it may be appropriate to address lower-level hazards before higher level hazards if quick abatement is possible and effective interim protection is in place to provide protection until the final abatement action can be implemented. For example, for a one time only work activity with a hazard for which an engineering solution would require extensive resources, an interim abatement action for the hazard without follow through to perform the engineering action would be appropriate.

April 12, 2007

Section 18G, "Identifying, Reporting, and Correcting Nuclear and Worker Safety Issues and Nonconformances"

Note: Over 75% of this Section is either new or has changed and should be read in its entirety.

*Indicates a substantive change.

This section was revised to:

- **Change:** SME from "Ron Simonton" to "Darlene Moore."
- **Add:** A review date, which indicates that an ES&H Manual Self-Assessment (SA) checklist was completed for this section.

ES&H Manual Glossary



- ***Add:** The following definitions.
 - DOE Safety Requirements
 - Noncompliance (Safety Rules)
 - Noncompliance Tracking System (NTS)
 - Nonconformance (Safety Rules)
 - Price-Anderson Enforcement Program
 - Safety and Security Issues Review Committee (SSIRC)
 - Safety Rules
 - Sandia Safety Rules Local Tracking System



- ***Delete:** The following definitions.
 - Noncompliance, PAAA
 - Noncompliance Tracking System (NTS)
 - Nonconformance, PAAA
 - PAAA Review Board
 - PAAA Review Committee (PARC)
 - Sandia PAAA Tracking System

April 9, 2007



[Chapter 11, "ES&H Training"](#)

Note: (*) asterisk denotes substantive change.

This chapter was revised to:

- **Change:** The CA Counterpart **from** Gwendolyn Mosley **to** Terry Garner.
- Under topic "Responsibilities For ES&H Training," under subtopic "ES&H Functional Managers/Program Owners," under "Requirements":
 - ***Change:** The requirement **from** "Interpreting ES&H regulations and requirements to identify ES&H training requirements" **to** "Identifying ES&H training requirements."





Administrative Changes Only April 9, 2007

Section 6D, "Hazard Communication Standard"

- In Section 6D and Attachment 6D-1:
 - **Change:** the California counterpart from Donn Wright to Al Buerer.
- Under topic, "Applicability":
 - **Delete:** "Building 6596 High Bay Storage Area."
- In the Direct Access Services List, under topic, "Cryogen Safety":
 - **Delete:** "Donn Wright (CA)."
- In the Direct Access Services List, under topic, "Injury/illness database":
 - **Delete:** "Donn Wright (CA)."



Section 6E, "Laboratory Standard - Chemical Hygiene Plan"

- In Section 6E:
 - **Change:** the California counterpart from Donn Wright to Al Buerer.
- Under topic, "Applicability," under "Exemptions":
 - **Delete:** "Building 6596 High Bay Storage Area."



March 26, 2007

Section 10D, "Polychlorinated Biphenyl (PCB) Management"

Note: (*) asterisk denotes substantive change.

This section has been revised to:

- Under the topic "Identification," in the subtopic "Requirements":
 - ***Change:** "Owners of oil or equipment or items that contain oil shall determine if the oil contains polychlorinated biphenyls (PCBs) and at what concentration. This may be accomplished either by contacting the PCB program coordinator to request sampling/analysis or by reviewing the material safety data sheet (MSDS) or other documentation for the equipment."
- to**
- "Owners of oil or substances, or items and equipment, known or suspected to have been manufactured prior to 1980, that contain oil shall determine if the oil contains polychlorinated biphenyls (PCBs) and at what concentration. This may be accomplished either by contacting the PCB program coordinator to request sampling/analysis or by reviewing the material safety data sheet (MS DS) or other documentation



for the equipment. Substances that may contain PCBs include, but are not limited to: dielectric fluids, solvents, heat transfer fluids, hydraulic fluids, paints or coatings, sludges, slurries, sediments, dredge spoils, soils, and other chemical substances or combinations of substances, including impurities and byproducts and any byproduct, intermediate, or impurity manufactured at any point in a process."

- Under the topic "Disposal," in the subtopic "Requirements":
 - **Replace:** "Chemical/Material Waste Disposal Request" **with** "Waste Description Disposal Request."
 - **Delete:** Text referring to the above replaced request that states " (see Attachment 19A-6, 'Sample Chemical/Material Waste Disposal Request (CWDR)' [Word file/Acrobat file])."
- Under the topic "Related Hazards and Activities," under "Reference":
 - **Change:** "Section 19A, Attachment 19A-6, 'Chemical/Material Waste Disposal Request (CWDR)'" **to** "Request disposal of waste using a WDDR by linking to the Disposal Process website."

March 19, 2007

Section 4E, "Hot Work Safety"

Note: (*) asterisk denotes substantive change.

This section has been revised to:

- Under topic "Training":
 - ***Change:** the training requirements **from** "Sandia employees and Sandia-Directed Contractors who perform hot work or are designated as fire watchers are required to have taken FRP106 (Fire Extinguisher Training Hands-On) prior to performing hot work or firewatch duties, and every three years thereafter" **to** "Sandia employees and Sandia-Directed Contractors who perform hot work or are designated as fire watchers are required to have taken FRP106 (Fire Extinguisher Training Hands-On) prior to performing hot work or firewatch duties, and annually thereafter."
 - ***Delete:** the Sandia employee or Sandia-Directed Contractor specification, "who has not taken FRP106 within the last three years."
- Under topic "Hot Work Permits":
 - ***Change:** requirement **from** "For written approval before performing soldering, welding, or cutting operations on used containers, consult the [site fire marshal](#)" **to** "For written approval before performing open-flame soldering, welding, or cutting operations on used containers, consult the [site fire marshal](#)."
- Under topic "Related Hazards and Activities":
 - **Change:** reference **from** "[Section 4C](#), "Lockout/Tagout and Administrative Control Locking" **to** "[Section 4C](#), "Lockout/Tagout (LOTO)."
- Under topic "Related Documents":
 - **Change:** reference **from** "ANSI Z49.1-1994, *Welding, Cutting and Allied Processes, Safety in*" **to** "ANSI Z49.1-1994, *Welding, Cutting and Allied Processes, Safety*."



March 19, 2007

Section 6Q, "Nanomaterials"

Note: This section is new and should be read in its entirety.

ES&H Manual Glossary:

- ***Add:** The following definitions:
 - ***Nanomaterial** – Materials incorporating engineered nanoparticles or nanoscale features that exhibit unique physical and chemical properties as a result of the nanoparticles or nanoscale features.
 - ***Nanoparticle** – In nanotechnology, a sub-classification of ultrafine particle with lengths in two or three dimensions greater than 0.001 micrometer (1 nanometer) and smaller than about 0.1 micrometer (100 nanometers) and which may or may not exhibit a size-related intensive property. The length scale may be a hydrodynamic diameter or a geometric length appropriate to the intended use of the nanoparticle.
 - ***Ultrafine particle** – In nanotechnology, a particle ranging in size from approximately 0.1 micrometer (100 nanometers) to 0.001 micrometer (1 nanometer).



March 19, 2007

Section 18B, "Safety Engineering Accident Investigation (AI) Process"

Note: (*) asterisk denotes substantive change.

This section has been revised to:



- **Add:** Review Date to indicate that this section was Self Assessed.
- Under topic, "Scope":
 - ***Change:** "This accident investigation process is documented for use when accidents/injuries and/or near misses occur on Sandia-controlled premises or involve Sandia employees or contractors. This process should be utilized when line management and ES&H management determine that an accident/injury or near miss does not meet either a Type A or B investigation as defined in ES&H Manual Section 18C, "Occurrence Reporting," Attachment 18C-1 however, the investigation requires a high level of rigor utilizing the methods outlined by DOE and in the DOE G 225.1A-1, Implementation Guide for use with DOE Order 225.1A, Accident Investigations."

to

"This accident investigation process is documented for use when accidents/injuries and/or near misses occur on Sandia-controlled premises or involve Sandia employees or contractors. This process should be utilized when line management and ES&H management determine that an accident/injury or near miss investigation requires a high level of rigor utilizing the methods outlined by DOE G 225.1A-1, *Implementation Guide for use with DOE Order 225.1A, Accident Investigations.*"



- ***Add:** **Note:** For information on the accident investigation process for injuries and illnesses that are

deemed not to require this level of rigor, see the paragraph below, "Typical Injury/Illness Accident Investigation Process," for a description of the process."

- **Add:** Subtopic, "Requirements" under "Responsibilities," above the text stating the roles and responsibilities of Members of the Workforce.
- **Add:** Subtopic, "Guidance," under "Criteria for Investigation," above the text describing accident/injuries or near misses that meet the criteria for the investigation process.
- ***Add:** Topic, "Typical Injury/Illness Accident Investigation Process," including requirements for all MOW.

Note: This is a new topic and should be read in its entirety.

- ***Change:** Subtopic under "References" **from** "Requirements Source Documents" **to** "Related Documents."
 - **Delete:** The archived DOE order, "DOE-STD-1004-92, *Root Cause Analysis Guidance Document.*"
 - **Add:** "DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information.*"

Administrative Changes Only March 15, 2007

Section 4K, "Traffic Safety"

This section was revised to:

- **Change:** The review date in the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed for this document.

March 5, 2007

Section 17B, "Air Permits"

Note: (*) asterisk denotes substantive change.

This section has been revised to:

- Under topic "Planning" and under subtopic "Requirements":
 - ***Change:** The first bullet **from** "Determine the need for a permit and give notice (see Attachment 17B-1, "Giving Notice") if one or more of the following conditions exists" **to** "Consult with the air quality contact to determine the need for a permit and give notice (see Attachment 17B-1, "Giving Notice") if one or more of the following conditions exists."
 - **Change:** The second bullet **from** "During preconstruction" **to** "During preconstruction activities."
 - ***Change:** The requirement listed under "During preconstruction activities" **from** "Actual emissions of a regulated air contaminant at a rate greater than 2,000 pounds per year" **to** "Potential emissions of a regulated air contaminant at a rate greater than 2,000 pounds per year."
 - ***Change:** The requirement listed under "During preconstruction activities" **from** "Emissions from an

internal combustion—emergency engine/generator" **to** "Emissions from an electrical power generator."

- ***Add:** The following new requirement under "During preconstruction activities":
 - Emissions from fossil fuel (e.g., natural gas, diesel) fired boilers.
- ***Change:** The requirement listed under "During preconstruction activities" **from** "Any hazardous air pollutant emissions that have the potential to exist (see Chemical Inventory System)" **to** "Any chemicals classified as [hazardous air pollutants](#) (also see Chemical Inventory System)."
- **Change:** The requirement listed under "During preconstruction activities" **from** "Any radionuclide emissions that have the potential to exist (see Section 17E, "Radionuclide National Emissions Standards for Hazardous Air Pollutants [NESHAP])" **to** "Any potential radionuclide emissions (see Section 17E, "Radionuclide National Emissions Standards for Hazardous Air Pollutants [NESHAP])."
- ***Delete:** The following two requirements listed under "For Fugitive dust control/demolition activities":
 - Performing abrasive pressure-blasting operations.
 - Operating a mechanical (leaf) blower or other devices designed to use forced air to move dust or organic material and debris.

● Under topic "Permitting Process" and under subtopic "Requirements":

- ***Delete:** The "Title V Operating" permit from the permits listed under the heading "Activities."
- ***Add:** The following four requirements under the heading "Activities," to the list of information that is to be provided, as applicable, to the air quality contact for compliance with permit conditions/requirements:
 - List of chemicals with estimated annual usage/quantity.
 - List of all fuel burning equipment specifically including electrical power generators and boilers.
 - Name plate boiler size in mmBtu per hour and fuel type.
 - Name plate generator size in hp per hour and fuel type.
- ***Change:** The requirement under the heading "Activities" **from** "Quantity and type of emissions" **to** "Quantity and type of emissions, if known."
- ***Change:** The first sentence under the heading "Documentation" **from** "Members of the Workforce who submit a permit application shall" **to** "Members of the Workforce who have operations covered by an air quality permit shall."
- ***Add:** The following new requirement under the heading "Documentation":
 - Post a copy of the permit at the source location.
- ***Change:** The requirement under the heading "Documentation" **from** "Document all activities and information required by the permit" **to** "Collect and maintain all data required by the permit."
- ***Add:** The following new requirement under the heading "Documentation":
 - Complete all reporting requirements prescribed by the permit.
- ***Change:** The requirement under the heading "Documentation" **from** "Keep a copy for as long as the permit is in effect" **to** "Keep a copy of the permit records for as long as the permit is in effect at the facility and in the appropriate organizational files."

- **Delete:** From under the heading "Documentation," the requirement "Retain copies of permits posted at the facility and in organizational files."
- Under topic "Preconstruction Permit" and under subtopic "Requirements":
 - **Change:** The Note by removing "Fuel fired generator applications" from the list of items that are part of the preconstruction permit process.
 - **Clarify:** The last sentence by adding "Form" after each of the two listed permits.
- Under topic "Fugitive Dust Control/Demolition Permit" and under subtopic "Requirements":
 - **Change:** The first sentence **from** "Before conducting any fugitive dust generation or demolition activities, Members of the Workforce who are responsible for activities that involve creating or generating dust shall" **to** "Before conducting any [fugitive dust](#) generation or demolition activities that involve disturbance of more than ¾ of an acre or 75,000 cubic feet of demolition, Members of the Workforce who are responsible for these activities shall."
 - **Change:** The first requirement **from** "Complete and sign the Application for a Fugitive Dust Control Permit, including a Fugitive Dust Control Plan" **to** "Complete the Application for a Fugitive Dust Control Permit, and submit to the Air Quality Compliance Program Department 10333."
 - **Change:** The second requirement **from** "Submit the application and plan, with the necessary fee, to the City of Albuquerque's Environmental Health Department" **to** "The AQC Program Lead shall route the permit for appropriate signatures and submit the application and plan, with the necessary fee, to the City of Albuquerque's Environmental Health Department."
 - **Delete:** The first Note which states: "For information regarding fees, see Section 20.11.2.15 under 20.11.2 NMAC, Fees."
 - **Change:** The last requirement **from** "Provide a copy of the approved Fugitive Dust Control/Demolition Permit to the air quality contact" **to** "The AQC Program Lead shall provide a copy of the approved Fugitive Dust Control/Demolition Permit to the responsible Member of the Work Force."
- Under topic "Open Burn" and under subtopic "Prohibited and Accidental Burning":
 - **Change:** The requirement **from** "Members of the Workforce shall **Not** burn explosives considered and regulated as a hazardous waste subject to [Section 19A](#), "Hazardous Waste Management," of the ES&H Manual" **to** "Members of the Workforce shall **Not** burn explosives or any other items considered and regulated as a hazardous waste subject to [Section 19A](#), "Hazardous Waste Management," of the ES&H Manual unless an approved permit has been obtained for that purpose."
- Under topic "Open Burn," under subtopic "Non-Permit Activities," under "Requirements":
 - **Change:** The first sub-bullet **from** "Detonating 20 pounds (9 Kilograms) or less of explosives" **to** "Detonating 20 pounds (9 Kilograms) or less of non-waste explosives."
- Under topic "Open Burn," under subtopic "Open Burn Permit," under "Requirements":
 - **Change:** The last sentence **from** "Explosives may be considered and regulated as a hazardous waste subject to [Section 19A](#), "Hazardous Waste Management," of the ES&H Manual" **to** "Note: Burning of explosives may be considered and regulated as hazardous waste treatment subject to [Section 19A](#), "Hazardous Waste Management," of the ES&H Manual. Additional permits may be required."
- Under topic "Open Burn," under subtopic "Open Burn Activities," under "Requirements":
 - **Add:** A reference to the Note (located at bottom of "Requirements") to the Table item "Disposal by burning



of explosives to avoid transport or handling hazards."

- ***Change:** The requirement **from** "Members of the Workforce shall notify the [air quality contact](#), DOE, and the Albuquerque Environmental Health Department (at 224-6977) if an open burn is canceled, postponed, or rescheduled" **to** "Members of the Workforce shall notify the [air quality contact](#), DOE, and the Albuquerque Environmental Health Department (at 224-6977) if a notified open burn is canceled, postponed, or rescheduled."
- In Attachment 17B-2, "Getting a Permit," under topic "Required Permits," and under subtopic "Requirements":
 - **Clarify:** The first item listed in step 1 of the table **from** "For preconstruction, complete the Source Registration and Authority-to-Construct Permit and the Gasoline or Diesel Internal Combustion Emergency Engine/Generator Permit" **to** "For preconstruction, complete the Source Registration and Authority-to-Construct Permit Form and/or the Gasoline or Diesel Internal Combustion Emergency Engine/Generator Permit Form."
 - ***Change:** Step 2 of the table **from** "For preconstruction and open burn activities, provide information to the air quality contact in order to complete the permit application for submittal to DOE. For fugitive dust control/demolition activities, submit the multi-page forms to the Albuquerque Environmental Health Department (AEHD) with the appropriate fee" **to** "For preconstruction and open burn activities, provide information to the air quality contact in order to complete the permit application for submittal to DOE/ Albuquerque Environmental Health Department (AEHD)."
 - ***Change:** Step 3 of the table **from** "Verify that the air quality contact has received the permit application or a copy of the approved fugitive dust control/demolition permit" **to** "For fugitive dust control/demolition activities, submit the multi-page forms to the air quality contact for review and signatures. After SNL and DOE approval, submit the application form to the AEHD with the appropriate fee. Provide the AEHD approved permit to the air quality contact."



February 28, 2007



Chapter 16, "Health, Benefits, and Employee Services"

Note: (*) asterisk denotes substantive change.

This section has been revised to:

- ***Delete:** Topic, "Smoke-Free Workplace" and its requirements.

February 7, 2007

Chapter 5, "Fire Protection"

Note: (*) asterisk denotes substantive change.

This section has been revised to:

- Under topic, "Permits," in subtopic, "Requirements":
 - ***Add:** Requirements for "Welding, Cutting (Thermal) and Brazing Control (WCBC) Permits" that state:

Managers who are responsible for welding, thermal cutting, and brazing activities shall ensure that Members of the Workforce contact the Industrial Hygienist on the Division ES&H Customer Support Team to obtain a Welding, Cutting, and Brazing Control (WCBC) Permit prior to obtaining a Hotwork Permit. A Hotwork Permit will not be issued until a WCBC Permit has been obtained from Industrial Hygiene.

Implementation of interim control measures (e.g., full face air-purifying respirators, local exhaust ventilation) may be required until effective, documented, work controls and/or conditions are approved.

- ***Delete:** "Members of the Workforce shall contact the Industrial Hygienist on the Division ES&H Customer Support Team to complete an occupational exposure assessment (OEA). Contractor Personnel [Contractor-Directed] are also responsible for completing a representative occupational exposure assessment (OEA) for their employees. An OEA is required prior to obtaining a hot work permit or initiating hot work activities involving brazing, thermal cutting, or welding. An OEA is required prior to the commencement of the initial hot work activity and when changes in materials, work controls, or any operational conditions may impact personnel exposure. If a documented OEA has been previously completed and is representative of the proposed hot work activity, an additional OEA is not necessary."
- ***Change:** Note **from** "A permit will be granted only if the requester's training is current." **to** "A Hotwork Permit will be granted only if a WCBC Permit has been obtained AND the requester's training is current."

- Under topic, "Fire Barriers," in subtopic, "Requirements":

- ***Add:** An additional requirement that states, "Members of the Workforce shall: **Not** modify existing fire doors (e.g. installing door louvers, vision windows, cutting doors or drilling holes)."
- ***Change:** The note that states, "Fire Doors are identified by an Underwriter's Laboratory® label affixed to the hinged part of the door or by a sign placed on the door by fire protection or the building manager" **to** "Fire doors are identified by a label affixed to the edge of the door or by a sign placed on the door by fire protection or the building manager."
- ***Add:** Requirements that state, "Members of the Workforce performing construction type activities that penetrate fire barriers shall":
 - Firestop all penetrations through fire barriers as detailed in [Sandia Construction Standard Specification Section 07270, Firestop and Smokestop Systems](#) and the International Building Code, Chapter 7 Fire-Resistance-Rated Construction, Section 712, "Penetrations," and Section 713, "Fire-Resistant Joint Systems."
 - Smokestop all penetrations through smoke barriers as detailed in [Sandia Construction Standard Specification Section 07270, Firestop and Smokestop Systems](#) and the International Building Code, Chapter 7 Fire-Resistance-Rated Construction, Section 712, "Penetrations," and Section 713, "Fire-Resistant Joint Systems."
 - Penetrations include but are not limited to: voids around pipes, ducts, conduits, cable trays; joints between fire barriers and other construction; other joints and openings.
 - Remove fire doors no longer in use and fill resulting door openings with approved fire rated construction and firestopping.

**Administrative Changes Only
January 30, 2007**



Section 6R, "Indoor Air Quality"

This section was revised to:

- **Change:** The Review Date in the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed on this section.
- Under the topic "Reporting of Indoor Air Quality Concerns" and under subtopic "Guidance":
 - **Change:** The sentence **from** "Members of the Workforce should collect and provide information about the potential indoor air quality problem to investigators throughout the course of the investigation" **to** "Members of the Workforce should collect and provide information about the potential indoor air quality problem to the Customer Support Team (CST) Industrial Hygienist (IH) throughout the course of the investigation."
 - **Delete:** "Number of individuals affected" from the bulleted list of observations that should be made and recorded pertaining to potential indoor air quality problems.
 - **Change:** The bullet **from** "Observations about the work area and associated odors (e.g., stale or stuffy air, lingering odors), a description of unusual odors or excessive dustiness, or discolored material indicative of mold or mildew in the work area" **to** "Observations about the work area and associated odors, and a description of unusual odors or excessive dustiness."
 - **Change:** The bullet **from** "Other information that might be useful in establishing a pattern for the problem, such as weather or problems with the air conditioning, or heating" **to** "Other information that might be useful in establishing a pattern for the problem, such as weather or problems with the air conditioning, heating, room heaters or humidifiers."
 - **Replace:** "Animals" from the bulleted list of common sources of indoor air quality problems with "Pests (rodents, insects, etc.)."
- Under the topic "Responsibility for Addressing Indoor Air Quality Problems" and under subtopic "Guidance":
 - **Add:** The sentence "Managers should contact the Customer Support Team (CST) Industrial Hygienist (IH) upon MOW concern regarding indoor air quality."
- Under the topic "Preservation of Indoor Air Quality" and under subtopic "Guidance":
 - **Change:** The sentence **from** "Members of the Workforce should refrain from performing actions that might degrade indoor air quality such as: Allowing vehicles to idle in the vicinity of building fresh-air intakes" **to** "Members of the Workforce should refrain from performing actions that might degrade indoor air quality such as: Allowing vehicles to idle in the vicinity of building fresh-air intakes or near building entrances."

January 29, 2007



Chapter 11, "ES&H Training"

Note: Over 75% of this section is either new or has changed and should be read in its entirety.



ES&H Manual Glossary:

- ***Add:** The following definitions:

- *Classroom instructor
- *Competency
- *Exception
- *Graded approach
- *Instructor
- *Instructor qualification
- *Job analysis
- *Learning objective
- *Lesson plan
- *Line-managed training
- *On-The-Job Training (OJT)
- *On-The-Job Training (OJT) instructor
- *On-The-Job Training (OJT) six-step process
- *Program-managed training
- *Qualified
- *Task analysis
- *Training
- *Training program

**Administrative Changes Only
January 25, 2007**

Section 4C, "Lockout/Tagout"

This section was revised to:

- **Change:** the subject matter expert **from** Mark Warner **to** Ralph Fevig.
- **Change:** the NM subject matter expert (SME) in the Direct Access Services (DAS) list under the heading "Lockout/tagout" **from** "Mark Warner" **to** "Ralph Fevig."
- Above the Table of Contents:
 - **Delete:** the hyperlink to Safety Engineering Program, LOTO Website.
- Under "Applicability and Scope":
 - **Add:** "See the Safety Engineering Program, LOTO Website for additional information."
- In Attachment 4C-1, "LOTO Catalog," in the first table:



- o **Change:** the SNL/NM contact **from** "Mark Warner, MS 1093, 284-6070, 844-9977 (fax)" **to** " Ralph Fevig, MS 1094, 284-6388, 844-9977 (fax)."

Administrative Changes Only January 23, 2007

Section 6Z, "Chronic Beryllium Disease Prevention Program"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- **Change:** The Review Date in the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed on December 18, 2006.



January 5, 2007

Section 12C, "Commercial Motor Vehicles (CMVs) and Commercial Driver's Licenses (CDLs)"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- **Add:** Review Date to indicate that this section was Self Assessed.
- Under topic, "Training and Certification," in the subtopic "Requirements":
 - o ***Change:** Table note 4, in Table 3, from "chauffeur" to "passenger."
- Under topic, "Federal Motor Carrier Safety Regulations," in the subtopic "Requirements":
 - o ***Add:** Additional requirements for Members of the Workforce who operate commercial vehicles both offsite and onsite to complete Driver Vehicle Inspection Reports (DVIR) on each vehicle driven.
- Under topic, "Commercial Vehicles and Drivers," in the subtopic "Requirements":
 - o ***Add:** Requirements for the FMCSR Program owner to ensure that Members of the Workforce who operate commercial vehicles either onsite or offsite fulfill their responsibilities.
 - o ***Change:** The Requirement for drivers of CMVs Onsite in Table 4, "A vehicle inspection checklist completed daily; if multiple trips are taken in a single day, they can be included in one inspection list." **to** "Complete a driver vehicle inspection report daily on each vehicle operated."
- Under topic, "References":
 - o ***Add:** To "Requirements Source Documents," DOE O 460.1B, *Packaging and Transportation Safety*.



ES&H Manual Glossary:

- o ***Change:** In the definition, "**Onsite [with respect to packaging and transportation]**" – boundaries **from** "At SNL/CA, "onsite" is considered to include all areas bordered by East Avenue, Vasco Road and

Greenville Road that are within Sandia-controlled, DOE-owned property boundaries." to "At SNL/CA, "onsite" is considered to include all areas bordered by Vasco Road and Greenville Road that are within Sandia-controlled, DOE-owned property boundaries."



[Bob Goetsch](#) - Content

[IMT](#) - Web Providers



ES&H Manual

SECTION 6E – LABORATORY STANDARD - CHEMICAL HYGIENE PLAN

Subject Matter Expert: [Linda Stiles](#); CA Counterpart: [Al Buerer](#)

MN471001, Issue F

Revision Date: [June 28, 2006](#); Replaces Document Dated: February 12, 2004

Review Date: June 19, 2006

Administrative Changes: [April 9, 2007](#)

*Indicates a substantive change

- [Applicability](#)
 - [*Training](#)
 - [*Contacting Industrial Hygienists](#)
 - [*Occupational Exposure to Hazardous Chemicals in Laboratories](#)
 - [Labels and Material Safety Data Sheets \(MSDSs\)](#)
 - [Technical Work Documents \(TWDs\)](#)
 - [*Particularly Hazardous Chemicals](#)
 - [Ototoxic Chemicals](#)
 - [Good Laboratory Practices](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
-

APPLICABILITY

For purposes of this document, [Members of the Workforce](#) are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section constitutes SNL's Chemical Hygiene Plan (CHP) as required by [29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories* (commonly referred to as the "Laboratory Standard"). The Subject Matter Expert for this Section of the *ES&H Manual* is the Sandia [Chemical Hygiene Officer](#). At least annually, the Chemical Hygiene Officer will perform a documented review and evaluation of this section for effectiveness and update it as necessary. Effectiveness will be measured by the ability of the Chemical Hygiene Plan, when implemented, to:

- Protect Members of the Workforce from health hazards associated with hazardous chemicals in the laboratories.
- Keep chemical exposures below applicable exposure limits.

SNL's CHP consists of the following:

- Training on [hazardous chemicals](#) in the [laboratory](#) (see "[Training](#)," for more information).
- Information on controlling occupational exposure to [hazardous chemicals](#) in the laboratory (see "[Occupational Exposure To Hazardous Chemicals In Laboratories](#)," "[Labels And Material Safety Data Sheets \(MSDSs\)](#)," "[Technical Work Documents \(TWDs\)](#)," and "[Good Laboratory Practices](#)," for more information).
- Requirements for handling [particularly hazardous substances](#) in the laboratory (see "[Particularly Hazardous Substances](#)" for more information).
- Guidance for handling [ototoxic chemicals](#) in the work area (see "[Ototoxic Chemicals](#)" for more information.)

Exemptions

This section applies to all [Members of the Workforce](#) and activities unless specifically exempted. Specific premises and activities that are exempted include:

- At SNL/NM:

- Hazardous Waste Management Facility (HWMF)
- Thermal Treatment Facility (TTF)
- Corrective Action Management Unit (CAMU)
- Radioactive and Mixed Waste Management Facility (RMWMF)
- Manzano Storage Bunkers 37034, 37045, 37055, 37063, 37078, and 37118
- Auxiliary Hot Cell Facility

- At SNL/CA:

- Hazardous Waste Facility
- Mixed Waste Facility
- Building 914 Model Shop
- Building 979 Hazardous Materials Machine Shop
- Hazardous waste cleanup operations (e.g., environmental restoration [ER] projects)
- Neutron generator production
- Radioisotope production
- Z-Machine maintenance and operation activities
- Construction and maintenance activities
- Custodial activities
- Building decontamination and demolition activities

- Responding to a [foreseeable emergency](#)
- Protective forces/security
- Shipping and receiving services
- Building 878 PZT Production Area
- Fleet Services
- [Chemical Information System](#)



*TRAINING

Requirements

Work Activity or Role	Required	Recommended
All laboratory workers who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies	LAB100	N/A
Any site-specific activity involving potential exposure of laboratory workers to hazardous chemicals under normal operating conditions or in foreseeable emergencies .	LAB103	N/A



All Members of the Workforce who may be exposed to an ototoxic chemical either by itself or in concert with high-noise or high ultrasound level hazards.	N/A	NSE100 (annually)
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Managers shall be responsible for ensuring that:

- [Members of the Workforce](#) are provided with appropriate information and training to ensure that they are apprised of the hazards of chemicals present in their work area:

- At the time of their initial assignment.
- Whenever a new [physical hazard](#) or [health hazard](#) is introduced into their work area and [Members of the Workforce](#) have not previously been trained on the new hazard.
- Prior to assignments involving new exposure situations.


- [Members of the Workforce](#) using [hazardous chemicals](#) are informed of the following:

- Contents of [29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories* (commonly referred to as the "Laboratory Standard"), and its appendices (see [29 CFR 1910.1450](#) for contents of this standard).
- Location and availability of SNL's CHP as described in this section.
- Applicable OSHA Permissible Exposure Limits (PELs) and ACGIH Threshold Limit Values (TLVs).
- Signs and symptoms associated with exposure to hazardous chemicals used in the laboratory.
- Location and availability of reference material (e.g., material safety data



sheet [[MSDSs](#)]) on hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory.


- [Members of the Workforce using hazardous chemicals](#) receive training on:
 - The [physical hazards](#) and [health hazards](#) of the chemicals present in their work area.
 - The methods and observations that may be used to detect the presence or release of [hazardous chemicals](#) (continuous air monitoring, visual appearance or odor).
 - The measures that can be taken to protect themselves from these hazards (appropriate work practices, emergency procedures, and [personal protective equipment](#)).



Members of the Workforce who use hazardous chemicals shall review the contents of [29 CFR 1910.1450](#) and its appendices.

* CONTACTING INDUSTRIAL HYGIENISTS

Managers shall be responsible for contacting the Industrial Hygienist supporting the Division whenever an activity is planned that:

- 
- Involves a [particularly hazardous substance](#), an OSHA-regulated substance listed in [29 CFR 1910, Subpart Z](#), “Toxic and Hazardous Substances,” any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater, or there is the potential for exposure to [ototoxic chemicals](#).
 - Has the potential to expose a worker to a hazardous chemical above regulatory exposure limits (OSHA Permissible Exposure Limits [[PELs](#)], DOE [Action Levels \(beryllium\)](#), or ACGIH Threshold Limit Values [[TLVs](#)]).
 - Requires implementation of control measures (such as [local exhaust ventilation](#) and [personal protective equipment](#)) that are based on hazard evaluations, and which may include exposure monitoring.

- Involves the development or importation of [hazardous chemicals](#).

*OCCUPATIONAL EXPOSURE TO HAZARDOUS CHEMICALS IN LABORATORIES

Requirements


Managers of Members of the Workforce who engage in the [laboratory use of hazardous chemicals](#) shall be responsible for ensuring that:

- [Physical hazards](#) and [health hazards](#) associated with hazardous chemicals used in laboratory operations have been identified, evaluated, and controlled (see [“Contacting Industrial Hygienists”](#)).
- [Members of the Workforce](#) exposure to hazardous chemicals is controlled to ensure that it does not exceed the OSHA Permissible Exposure Limits ([PELs](#)), [DOE Action Levels \(beryllium\)](#), or ACGIH Threshold Limit Values ([TLVs](#)).
- Managers shall implement [control measures](#) based on hazard evaluations, which may include monitoring and/or consultation with their Division Industrial Hygienist (see [“Contacting Industrial Hygienists”](#)).
- Potential exposure through eye and skin contact is prohibited for [OSHA-regulated substances](#).
- Exposure monitoring for beryllium and [OSHA-regulated substances](#) are initiated if there is reason to believe exposure levels for that substance routinely exceeds the [action level](#) (or the OSHA PEL or ACGIH TLV in the absence of an action level - see [“Contacting Industrial Hygienists”](#)).
- Members of the Workforce have the opportunity to receive [medical consultation](#) if:
 - They develop signs and symptoms associated with a possible exposure to a hazardous chemical.

- An event (spill, leak, explosion, or other occurrence) in the work area results in the likelihood of a hazardous exposure.
- Exposure monitoring reveals exposure levels that routinely exceed the action level (or the OSHA PEL or ACGIH TLV in the absence of an action level) for [OSHA-regulated substances](#) requiring [medical surveillance](#).
- They review and approve laboratory operations, procedures, or activities whenever a new chemical or change in process is introduced which creates a potential health hazard to Members of the Workforce and which has not been evaluated by their [Division ES&H Team](#).
- [Engineering controls](#) such as fume hoods and other protective equipment such as eyewashes, safety showers, and [personal protective equipment \(PPE\)](#) are functioning properly and used according to [Section 6P](#), "Local Exhaust Ventilation (LEV)," [Section 6M](#), "Safety Showers and Eyewashes," [Section 4L](#), "Personal Protective Equipment (PPE)," and [Section 6C](#), "Respiratory Protection," respectively.
- Additional provisions for personnel protection are made for those who work with [particularly hazardous substances](#) (see "[Particularly Hazardous Substances](#)" for more information).
- Additional provisions for hearing conservation are made for those who are potentially exposed to [ototoxic chemicals](#) (see "[Ototoxic Chemicals](#)" for more information).
- Members of the Workforce understand and comply with SNL's Chemical Hygiene Plan (CHP) as described in this section and [29 CFR 1910.1450](#) (and its appendices).


Managers where hazardous chemicals are developed in the laboratory or imported into the laboratory shall be responsible for ensuring that Members of the Workforce understand and comply with additional requirements as defined in [Section 6D](#), "Hazard Communication Standard," and in [Attachment 6D-1](#), "Manufacture, Distribution, and Import of Hazardous Chemicals."

Members of the Workforce shall:

- 
- Inform management prior to using a hazardous chemical in an application for which a potential exposure exists that has not previously been evaluated.
 - Conduct laboratory operations according to SNL's CHP as described in this section.

Guidance


Members of the Workforce should contact their [Division ES&H Team](#) for assistance in:

- 
- Reviewing laboratory operations, procedures, or activities whenever a new chemical or change in process is introduced which creates a potential health hazard to Members of the Workforce, **and which may require contacting the industrial hygienist supporting the Division (see "[Contacting Industrial Hygienists](#)")**
 - Determining whether the workplace or activity is exempt from the Laboratory Standard.
 - Training.

LABELS AND MATERIAL SAFETY DATA SHEETS (MSDSs)

Requirements

Managers shall be responsible for ensuring that:

- 
- Labels on incoming containers of [hazardous chemicals](#) are not removed or defaced.
 - Any [material safety data sheets \(MSDSs\)](#) that are received with incoming shipments of hazardous chemicals are maintained and are readily accessible to [laboratory](#) Members of the Workforce.

Note: Additional requirements for obtaining or developing MSDSs apply when

chemicals are [manufactured](#), [distributed](#), or [imported](#) by Members of the Workforce (see [Section 6D](#), "Hazard Communication Standard," and [Attachment 6D-1](#), "Manufacture, Distribution, and Import of Hazardous Chemicals").

Guidance

Electronic access, microfiche, and other alternatives to paper copies of MSDSs are permitted as long as no barriers to immediate access in each workplace are created by such options.

Members of the Workforce should:

- Ensure that chemical containers have labels that adequately identify the contents of the container so associated hazards may be readily determined.
- Consult the [Chemical Information System \(CIS\) contact](#) on the ES&H Direct Access Services list for assistance in accessing MSDSs.
- Contact their [Division ES&H Team](#) for assistance in identifying, evaluating and controlling [physical hazards](#) and [health hazards](#) associated with hazardous chemicals, and for additional information or interpretation of labels and MSDSs.

TECHNICAL WORK DOCUMENTS (TWDs)

Requirements


Managers shall be responsible for ensuring that [technical work documents \(TWDs\)](#) (e.g., SOPs and OPs) that describe safety and health considerations are developed and followed if [laboratory](#) work involves the use of [hazardous chemicals](#), including [particularly hazardous substances](#) (see "[Particularly Hazardous Substances](#)" for more information).

Note: These TWDs are to be written and approved in accordance with [Chapter 21](#), "Technical Work Documents (TWDs)."



Guidance


Members of the Workforce in laboratories using hazardous chemicals may do one of the following:

- Adopt existing or use current [TWDs](#) as long as the reasonably anticipated hazards and controls **associated with the work activity** are addressed in the adopted document.
 - Develop and implement new **standard operating procedures** that meet the minimum requirements stated in this section.
 - Adopt one of SNL's SOPs for work with hazardous chemicals, **as long as the reasonably anticipated hazards and controls associated with the work activity are addressed in the adopted document**. TWDs may also be used in conjunction with other TWDs that address other hazards (e.g., [biological agents](#), physical agents).
- 

Members of the Workforce should develop TWDs for the use and handling of hazardous chemicals according to the following:

- "[Good Laboratory Practices](#)" as described in this section.
- [29 CFR 1910.1450, Appendix A](#), "*National Research Council Recommendation Concerning Chemical Hygiene in Laboratories (Non-Mandatory)*".
- [CPR400.1.1.1/GN470098](#), *Developing ES&H Procedures*.

Members of the Workforce should contact their [Division ES&H Team](#) for assistance in developing and implementing TWDs for the use and handling of hazardous chemicals.




*PARTICULARLY HAZARDOUS CHEMICALS


Requirements

Managers shall be responsible for ensuring that **there are provisions for additional protection** if Members of the Workforce must work with [particularly hazardous](#)

substances. Particularly hazardous substances include select carcinogens, reproductive toxins, and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions, where appropriate:

- 
- A designated area is established where work with a particularly hazardous substance may be conducted, and that the designated area is posted and its boundaries clearly identifiable while the particularly hazardous substance is used.
 - Decontamination procedures commensurate with the level of contamination are implemented when appropriate and prior to un-designating a designated area.
 - When feasible, containment devices (e.g., fume hoods, glove boxes) are used (see Section 6P, "Local Exhaust Ventilation (LEV)" for more information).
 - Procedures for safe removal of contaminated waste are developed and implemented (see Chapter 19, "Waste Management" for more information).

Guidance




Members of the Workforce should contact their Division ES&H Team for assistance and recommendations regarding work with particularly hazardous substances.

OTOTOXIC CHEMICALS

Guidance

Managers should ensure that:

- 
- Potential exposure is evaluated to determine if Members of the Workforce are exposed at 20% or more of the ACGIH Threshold Limit Value (TLV) for ototoxic chemicals.
 - Members of the Workforce who are exposed at 20% or more of the ACGIH TLV for ototoxic chemicals are enrolled in the Hearing Conservation Program to monitor for any potential adverse effects in hearing (See Section 6H, "Noise Exposure and Hearing Conservation," for more information).

- Sandia Health Services and the industrial hygiene representative on the Division ES&H Team are notified regarding Members of the Workforce who are potentially exposed to ototoxic chemicals and high-noise or high ultrasound levels for potential synergistic effects on the organs or nerves involved in hearing or balance.
- The appropriate Division ES&H Team is contacted regarding Members of the Workforce who work with ototoxic chemicals in conjunction with high-noise or high ultrasound level hazards.





GOOD LABORATORY PRACTICES

Guidance

Members of the Workforce should follow these good laboratory practices when working with [hazardous chemicals](#) in a [laboratory](#):

- Understand and implement procedures for proper handling, storage, and disposal of hazardous chemicals and equipment they use.
- Ensure that warning signs are posted at areas or equipment where special or unusual hazards exist.
- Ensure that location signs are posted for exits, safety showers, eyewash stations (see [Section 6M](#), "Safety Showers and Eyewashes" for more information), and other safety and first aid equipment.
- Don appropriate [personal protective equipment \(PPE\)](#) (see [Section 4L](#), "Personal Protective Equipment (PPE)," for more information).
- Ensure appropriate [local exhaust ventilation \(LEV\)](#) is used for operations which might result in release of toxic chemical vapors, gases, or dust (see [Section 6P](#), "Local Exhaust Ventilation (LEV)" for more information).
- Consider substituting a less hazardous chemical when feasible.



- 
- Ensure that chemicals in open containers and hand-carried containers of hazardous chemicals are stored in unbreakable secondary containment.
 - Periodically examine stored chemicals for expiration, deterioration, and container integrity.
 - Purchase and store chemical substances in as small a quantity as is practical to minimize potential accidents, exposure, and generation of hazardous waste.
 - Avoid storage, handling, or consumption of food or beverages in laboratory areas (see [Section 6L](#), "Eating and Drinking" for more information).
 - Be alert to unsafe conditions and see that they are corrected when detected.
 - Vent apparatus that may discharge hazardous chemicals into local exhaust devices.
 - Avoid working alone with hazardous chemicals or performing operations involving hazardous chemicals in a locked laboratory or after normal working hours.
 - Keep chemical work areas clean and uncluttered.
 - Never use passageways, stairways, or hallways as storage areas.
 - Never smell or taste hazardous chemicals.
 - Never block access to exits, emergency equipment (e.g., eyewashes, safety showers), or utility controls.
 - Never use mouth suction for pipeting or starting a siphon.
- 
- Regularly conduct inspections for the following:
 - Housekeeping and chemical hygiene
 - Eyewashes and safety showers (see [Section 6M](#), "Safety Showers and Eyewashes" for more information)
 - Personal protective equipment (PPE) (see [Section 4L](#), "Personal Protective Equipment [PPE]" for more information)

- Other safety equipment
- Avoid underestimation of risk. Assume that any mixture will be more [toxic](#) than its most toxic component and that all substances of unknown toxicity are toxic.
- Avoid practical jokes or other behavior which might confuse, startle, or distract another worker.



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to the Laboratory Standard include:

Hazard/Activity	Reference
Chemical Information System (CIS)	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Chemical substances as identified in 40 CFR, Subchapter R , <i>Toxic Substances Control Act (TSCA)</i> implementing regulations	Section 6S , "Toxic Substances Control Act (TSCA)"
Excess metallic lead	Section 10L , "Management of Excess Metallic Lead"
Explosives	Chapter 9 , "Explosives Safety"
Fire extinguishers, material storage, flammable and combustible liquids, compressed gases	Chapter 5 , "Fire Protection"
Hazard communication	Section 6D , "Hazard Communication Standard"
Housekeeping	Section 4P , "Housekeeping"
Labeling and disposal of hazardous waste	Chapter 10 , "Environmental Protection" Section 19A , "Hazardous Waste Management"



Local exhaust ventilation (LEV) (e.g., laboratory hoods)	Section 6P , "Local Exhaust Ventilation (LEV)"
Medical consultation	Chapter 16 , "Health, Benefits, and Employee Services"
Movement of hazardous material	Chapter 12 , "Packaging and Transportation of Hazardous Material"
Preparation of material safety data sheets (MSDSs)	Section 6D, "Hazard Communication Standard," Attachment 6D-1 , "Manufacture, Distribution, and Import of Hazardous Chemicals"
Protective equipment and clothing	Section 4L , "Personal Protective Equipment (PPE)"
Respiratory protection for inhalation hazards	Section 6C , "Respiratory Protection"
Safety showers and eyewashes	Section 6M , "Safety Showers and Eyewashes"
Separation of eating and drinking from toxic material	Section 6L , "Eating and Drinking"
Signs	Section 4M , "Signs (including SWHAS) And Tags"
Spills and accidents involving hazardous material	Chapter 15 , "Emergency Preparedness and Management" Section 10E , "Chemical Spills" Section 6K , "Hazardous Waste Operations and Emergency Response (HAZWOPER)"
Work in remote or hazardous areas	Section 4A , "Working in High-Injury-Potential/Remote Operations"

*REFERENCES

Requirements Source Documents

 [10 CFR 850](#), *Chronic Beryllium Disease Prevention Program*.

[29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories*.


[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

[29 CFR 1910.1200](#), *Hazard Communication*.

[29 CFR 1910, Subpart Z](#), *Toxic and Hazardous Substances*.

[40 CFR 700-789](#), *TSCA Implementing Regulations*.

 SNL, [CPR400.1.1.1/GN470098](#), *Developing ES&H Procedures*.

SNL, [CPR400.1.1.24/GN470094](#), *Handling Chemicals at SNL/CA*.

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [Section 6Z](#), *SNL Chronic Beryllium Disease Prevention Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

 American Conference of Governmental Industrial Hygienists (ACGIH), *2006 TLVs[®] and BEIs[®] : Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, Cincinnati, OH, 2006 or latest edition.

[California Proposition 65 Chemical List](#), latest version.

International Agency for Research on Cancer (IARC), *Monographs*.

National Toxicology Program (NTP), [Annual Report on Carcinogens](#), latest edition.

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ES&H Manual

*SECTION 19A – HAZARDOUS WASTE MANAGEMENT

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* Indicates a substantive change

- [Applicability](#)
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 - [*19A-1](#) - Managing Hazardous Waste at a Less-Than-90-Day Accumulation Area

- [19A-2](#) - Examples of Potentially Incompatible Waste
- [19A-3](#) - Sample Hazardous Waste Labels ([Word file/Acrobat file](#))
- [19A-4](#) - Sample Explosive Hazardous Waste Label ([Word file/Acrobat file](#))
- [19A-5](#) - Instructions for Preparing an Explosive Waste Disposal Request (EWDR) ([Word file/Acrobat file](#))
- [19A-6](#) - Approval Request Process
- [19A-7](#) - Managing Excess and Waste Military Munitions



- Forms

- SF 2001-WAL, Waste Addition Log ([Word file/Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce who perform activities on [Sandia-controlled premises](#) within the State of New Mexico that constitute hazardous waste generation, management, accumulation, request for disposal, or [owners](#) as defined in this section.

This section does **not** apply to hazardous waste generated on Sandia-controlled premises managed in accordance with the requirements of the host facility. However, the following table provides a list of resources to consult for guidance regarding SNL/CA, TTR, KTF, and offsite hazardous waste generation.

Type of Operation	Resource for Assistance



<p>Managing, storing, and disposal of hazardous waste at SNL/CA, TTR, and KTF</p>	<p>Requirements and guidance are available as follows:</p> <ul style="list-style-type: none"> • SNL/CA - see CPR400.1.1.37/GN470075, <i>Guidelines for Waste Generators</i> • TTR - see SP473341, <i>Chemical Waste Management at TTR</i> • KTF - see EP-001, <i>Contingency Plan for Kauai Test Facility Hazardous Waste Management</i>
<p>Offsite hazardous waste generating operations</p>	<p>Contact the appropriate Division ES&H Team environmental protection representative early in the planning process and before any waste is generated.</p>

Questions regarding hazardous waste generation, management, storage, or disposal (including concerns as to whether this section applies to a specific activity) shall be directed to the appropriate [Division ES&H Team](#) environmental protection representative.

TRAINING

Work Activity or Role	Required	Recommended
<p>Members of the Workforce who generate, manage, accumulate, and/ or complete disposal requests for hazardous waste require annual training</p>	<p>ENV112 Required Annually</p>	<p>N/A</p>
<p>Managers associated with hazardous waste</p>	<p>N/A</p>	<p>ENV112</p>

ES&H coordinators associated with hazardous waste	ENV112 Required Annually	
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PLANNING AND PREPARATION—WASTE IDENTIFICATION

Requirements

[Owners](#) or [generators](#) of excess or waste military munitions shall follow requirements in [Attachment 19A-7](#), "Managing Excess and Waste Military Munitions."

Members of the Workforce who are [owners](#) or generators of hazardous waste shall plan how to control hazards and appropriately manage their hazardous waste as follows:

- Determine if the subject material meets the definition of "[hazardous waste](#)." If it does not, the requirements of this section do not apply.

- Regard the following as hazardous waste:

- All chemicals, including contained gases, liquids, and solids that are toxic, ignitable, corrosive, and/or reactive, unless a waste profile has been completed to determine that they are not hazardous.

Note: Examples of hazardous waste include, but are not limited to the following: solvents, acids, bases, oxidizers, flammable or combustible substances, commercial cleaning products, paints, explosives, propellants, pyrotechnics, and any liquid not specifically allowed in landfills, storm sewers, or sanitary sewers.

- Metals and waste contaminated with or containing these metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver, unless a waste profile has been completed to determine that they are not hazardous.

Note: Examples of metal-containing hazardous waste include, but are not

limited to, the following: nickel/cadmium batteries, cadmium-plated nuts and bolts, lead solder, incandescent light bulbs, lead/acid batteries, mercury thermostats, mercury vapor lamps, film negatives, photographic paper, or spent film processing fluids containing silver.

- Any waste items that are contaminated with or contain any of the above chemicals or metals, unless a waste profile has been completed to determine that they are not.

Note: Examples include, but are not limited to, the following: wipes, swabs, [debris](#), hardware, equipment, and certain empty containers.

- If the waste is an unused [commercial chemical product](#), determine if it is identified as an [acute hazardous waste](#).

Note: A listing is available by generic name in 40 CFR 261.33(e). If the waste is identified as an [acute hazardous waste](#), pay close attention to its unique waste management requirements.

Waste generators shall assume that a waste chemical or material is hazardous, unless the waste profile tool has been used to determine otherwise.

Guidance

The waste profile tool, as applied by the generator and applicable [Division ES&H Team](#) environmental protection representative, documents characterization of the waste through review of technical data and knowledge of process to determine the applicable environmental regulations. The waste profile may identify waste that is not hazardous waste and, therefore, is not subject to the requirements of this section; however, such waste may be subject to other requirements. Waste generators should contact the appropriate Division ES&H Team environmental protection representative to request a waste profile.

*WASTE ACCUMULATION–GENERATION

Requirements



Members of the Workforce who are [owners](#) or generators of [hazardous waste](#) shall accumulate waste in one of the following areas:

- At satellite accumulation points (SAPs) as outlined in this section.
- At less-than-90-day accumulation areas as outlined in [Attachment 19A-1](#), "Managing Hazardous Waste at a Less-Than-90-Day Accumulation Area."

Note 1: In a vast majority of instances, generators should choose to accumulate their hazardous waste at a SAP, because there are fewer associated requirements than there are for a less-than-90-day accumulation area. [Owners](#) and generators should be aware that the requirements for accumulating hazardous waste at an SAP are more restrictive in terms of waste volume, location, and who is allowed to contribute waste.



Note 2: Consult the appropriate [Division ES&H Team](#) environmental protection representative for assistance in determining which option is best for accumulating and managing waste.

Guidance

Members of the Workforce who are [owners](#) or generators of [hazardous waste](#) are encouraged to accumulate it in SAPs. Regulatory requirements are less stringent for less-than-90-day [accumulation areas](#) and, therefore, present a more efficient and effective mechanism for hazardous waste accumulation.

WASTE MINIMIZATION



Note: Sandia follows a waste management hierarchy:

1. Waste should be reduced or eliminated at the source.
2. If waste cannot be reduced or eliminated at the source, waste should be reused or recycled.

3. If waste cannot be reduced or eliminated at the source, reused, or recycled, contact your [Division ES&H Team](#) environmental protection representative for additional help.

Requirements

Members of the Workforce who are [owners](#) or [generators](#) of hazardous waste shall:

- Integrate methods to minimize the generation of hazardous waste into their daily work operations.
- Evaluate the following activities to minimize waste:
 - Process input:

- Minimize material use.

Note: Consider processes or material modifications that could eliminate or reduce the generation of waste. These changes can often be justified when the cost of waste disposal is considered for the life of the project or process.

- Limit the introduction and use of chemicals.

Note: Consider process or chemical modifications that could eliminate or reduce the generation of hazardous waste.

- Identify the least toxic or hazardous material that meets the design or process requirement.
- Encourage vendors to provide material in reusable or returnable forms.
- Recycle, reuse, and reclaim chemicals, material, and equipment.

Note: Consider the [Chemical Exchange Program \(CEP\)](#) before purchasing or disposing of unused chemicals.

- Process throughput:

- Optimize processes to improve overall efficiency and to reduce energy use and water consumption.
- Process output:
 - Decontaminate material and equipment
- Document waste minimization efforts.

Note: Consult the appropriate [Division ES&H Team](#) environmental protection representative before treating hazardous waste.



Guidance

Members of the Workforce who are [owners](#) or generators of hazardous waste should consult the appropriate [Division ES&H Team](#) environmental protection representative for ideas about methods for minimizing hazardous waste generation in specific processes and for information on [pollution prevention opportunity assessments \(PPOAs\)](#).

Note: The following materials and items are prime candidates for reuse and recycling:

- Elemental mercury.
- Precious and strategic metals.
- Compressed gas cylinders.
- Lead-acid and gel-cell batteries.
- Lead and lead bricks.
- Solvents.
- Unused laboratory chemicals.
- Scrap metal and solder scrap.
- Used oil from various sources.

- Empty drums.



WASTE PROHIBITIONS

Requirements

Unless approval is granted by the appropriate [Division ES&H Team](#) environmental protection representative, waste generators **shall not** do any of the following with material identified as hazardous waste:

- Treat, recycle, dilute, or volume-reduce the material.
- Discard the material into trash cans or dumpsters.
- Allow the material to enter sanitary waste lines or storm sewers via sinks, toilets, etc.
- Bury the material or release it to the ground, either directly or indirectly.
- Allow the material to evaporate or disperse into the atmosphere.
- Remove the material from [Sandia-controlled premises](#) or Kirtland Air Force Base.
- Bring any material identified as hazardous waste onto Sandia-controlled premises.

*MANAGEMENT OF COMMON WASTE STREAMS

Requirements

Members of the Workforce who are waste [owners](#) or [generators](#) shall observe the following requirements:

Type of Waste	Requirements
---------------	--------------

Aerosol cans

Waste aerosol cans that contain any amount of propellant or product shall be managed as [hazardous waste](#), unless the [waste profile](#) tool has been used to determine otherwise. At [SNL/NM](#), if an aerosol can is empty of propellant and product, is no longer pressurized, and does not contain residue of an [acute hazardous waste](#), it is considered an empty container and may be disposed of as regular trash.

- Do not spray out the remaining contents of an aerosol can for the sole purpose of emptying it.
- Never puncture an aerosol can.




Batteries

Waste batteries shall be managed according to the following:


- Carbon-zinc and alkaline batteries, sizes AAA through D and 9-volt, are not [hazardous waste](#) and may be disposed of in the regular trash.
- Nickel/cadmium (NiCad) and nickel metal hydride batteries may be picked up for disposal without submitting a [WDDR](#) by contacting the appropriate [Division ES&H Team](#) environmental protection representative; otherwise they shall be managed as hazardous waste.
- All other batteries shall be managed as hazardous waste, unless the waste profile tool has been used to determine otherwise (e.g., 6-volt lantern batteries).

Note: Cover battery terminals with non-conductive tape (such as electrical, masking, or duct tape) before depositing them in a hazardous waste [primary container](#).

Classified waste	<p>Classified waste is addressed on a case-by-case basis due to its unique or sensitive status and potential for being hazardous waste. Refer classified waste questions to the appropriate Division ES&H Team environmental protection representative for specific policies.</p> <ul style="list-style-type: none"> Do not ship classified hazardous waste between SNL/CA and SNL/NM.
Cured epoxies, sealants, adhesives	<p>Certain waste epoxies, sealants, or adhesives which have fully cured may not be hazardous waste depending on the contaminants. Contact the appropriate Division ES&H Team environmental protection representative to make this determination.</p>
Empty containers	<p>A container that held any chemical or hazardous waste, except a substance identified as an acute hazardous waste, is defined as an empty container if both of following criteria are met:</p> <ul style="list-style-type: none"> All contents have been removed that can be removed using the practices commonly employed to remove material from that type of container, such as pumping, pouring, or aspirating, and No more than 3% by weight of the total capacity of the container remains in the container or No more than 2.5 centimeters (one inch) of residue remains on the bottom of the container or inner liner. <p>Containers with a capacity of 5 gallons or less that meet the above criteria may be thrown in the trash. Empty containers with a capacity of greater than 5 gallons shall be submitted for disposal on a WDDR. Those containers shall be marked with the words "Empty Container," the disposal request number, and line item numbers.</p> <p>Note: Containers that held a substance identified as an acute hazardous waste shall be regarded as hazardous waste.</p>

 <p>Explosive contaminated items</p>	<p>Waste explosive-contaminated items, such as weighing pans, may be decontaminated with paper wipes and water, or a solution consisting of 20% isopropyl alcohol and 80% water. The wipes shall be disposed of as an explosive waste or a trace explosive-contaminated waste as appropriate.</p>
<p>Light bulbs: fluorescent and incandescent</p>	<p>Waste fluorescent light bulbs (intact or broken) have been profiled and determined not to be hazardous waste except as noted below. However, the bulbs shall be labeled with a hazardous waste label with words "hazardous waste" cut off and submitted for disposal or recycling according to the requirements in the "Disposal Request" section.</p> <p>Circular or U-shaped waste fluorescent and incandescent light bulbs shall be managed as hazardous waste, unless the waste profile tool has been used to determine otherwise.</p> <p>Do not place light bulbs/fluorescent tubes in glass box receptacles. See "Glass box receptacle" for additional information.</p>
 <p>Gas cylinders</p>	<p>Return gas cylinders that are empty or no longer needed to the vendor. Arrangements to return the gas cylinders to the vendor should be made at the time of purchase. Contact the appropriate Division ES&H Team environmental protection representative before purchasing any gas cylinder that cannot be returned to the vendor.</p>
 <p>Polaroid® print film and associated waste</p>	<p>The following used Polaroid® products may be disposed of in the regular trash:</p> <ul style="list-style-type: none">● Processed prints (pictures)● Used print backing● Empty film cartridges containing batteries <p>Unused print film and all other waste Polaroid® items shall be managed as hazardous waste, unless the waste profile tool has been used to determine otherwise.</p>

Residue from reacted explosives	The residue of explosives that has been completely reacted through normal use or testing is not explosive waste. However, the residue may be hazardous waste depending on the combustion products of the original explosive or other contaminants. The owner of the material is responsible for determining if the residue is hazardous waste.
Solder scrap	Solder (lead, tin, silver, etc.) scraps and pieces may be managed as a recyclable material instead of hazardous waste. For more information, contact the appropriate Division ES&H Team environmental protection representative.
Solvent contaminated wipes	Wipes or rags contaminated with certain specific solvents and used until dry may not be hazardous waste and, therefore, can be thrown in the regular trash. Contact the appropriate Division ES&H Team environmental protection representative to make this determination.
Trace explosive contamination	<p>The term, "trace explosive contamination," is used to denote certain explosive-contaminated waste items that may be regarded and managed as hazardous waste only because the level of explosive contamination is such that it does not present an explosive safety hazard to handlers.</p> <p>For explosive waste to be regarded as trace explosive contaminated, all of the following criteria shall be met:</p> <ul style="list-style-type: none"> ● The estimated explosive concentration shall be less than or equal to 1% by weight. ● The estimated total net explosive weight (NEW) shall be less than or equal to 1 gram per primary container. ● The explosive substance shall be distributed in such a manner and present in sub-critical diameter (listed in the <i>LLNL Explosives Handbook</i>) such that the explosives will not retain their explosive properties. ● The explosive substance is not a true primary explosive. (For the purpose of this definition, dry PETN, HMX, RDX, CP, and BNCP are not considered true primary explosives and may be managed as trace explosive contaminated

	waste.)
Toner cartridges	<p>Waste toner cartridges should be recycled, if possible. See Section 4P, "Housekeeping," for information on toner cartridge recycling.</p> <p>Toner cartridges that cannot be recycled shall be managed as hazardous waste or empty containers, unless the waste profile tool has been used to determine otherwise.</p> <p>Contact the appropriate Division ES&H Team environmental protection representative to determine whether a particular toner cartridge is recyclable. Follow the pollution prevention toner cartridge recycling process.</p>
Unknown waste	<p>Unknown waste shall be assumed hazardous waste and managed as such unless and until the contents are identified as non-hazardous waste. Generators should make every attempt to identify the waste by contacting possible owners. If identification attempts are unsuccessful, contact the appropriate Division ES&H Team environmental protection representative for assistance.</p>
Used oil	<p>Used or waste oil shall be managed as hazardous waste, unless the waste profile tool has been used to determine that it can be recycled through the Used Oil Program. See used oil management in this section for additional information. Contact your Division ES&H Team or the used oil program coordinator to request a waste profile.</p>

*Used Oil Management

Management of used oil is regulated under 40 CFR Part 279 of the federal hazardous waste regulations. The regulations establish requirements for generators of used oil, and burners, marketers, and processors of used oil fuel.

Definitions

[Used oil](#)

[Used oil generator](#)[Used oil aggregation point](#)**Recycling of Used Oil****Requirements**

[Used oil](#) to be recycled shall:

- Be free of radiation contamination.
- Contain less than 2 ppm polychlorinated biphenyls (PCBs).
- **Not** be mixed with a [hazardous waste](#) that exhibits characteristics other than ignitability.

Note: [Used oil](#) that is considered to exhibit a hazardous characteristic by its own nature (e.g., ignitability) and that has not been mixed with a hazardous waste may be recycled.

- **Not** equal or exceed 1,000 ppm total halogens unless: (1) the used oil is metalworking oils/fluids containing chlorinated paraffins; (2) the used oil is contaminated with chlorofluorocarbons (CFCs) removed from refrigeration units and the CFCs are destined for recycling; or (3) the generator has acceptable knowledge indicating that halogens are not a hazardous waste.
- **Not** exceed any of the following allowable levels.

Constituent/Property	Allowable Level (ppm)
Arsenic	5
Cadmium	2
Chromium	10
Lead	100
Total Halogens	1000

- Meet any acceptance criteria imposed by the [used oil](#) recycler.

If the [used oil](#) fails to meet any of the above criteria then a complete RCRA analysis shall be conducted and the used oil must be managed and labeled as a hazardous waste.

If the history or the process that generated the [used oil](#) is uncertain it may be recycled unless the “allowable levels” as outlined above have been exceeded. Should this be the case, a complete RCRA analysis shall be conducted to determine the regulatory status of the used oil. Pending receipt of the analytical results, the [used oil](#) must be managed and labeled as “Used Oil”.

Any [used oil](#) that is going to be disposed of in lieu of recycling shall undergo a complete RCRA analysis to determine the regulatory status. Pending receipt of the analytical results, the used oil must be managed and labeled as “Hazardous Waste.”

[Used oil generators](#) are subject to all applicable spill prevention, control and countermeasures (SPCC) in addition to the requirements of 40 CFR 279, *Used Oil Management*.

Storage of Used Oil

Requirements

- [Used oil generators](#) shall not store used oil in units other than tanks or containers.
- Containers and aboveground tanks used to store [used oil](#) shall be in good condition (no severe rusting, apparent structural defects or deterioration); and
- Not leaking (no visible leaks).

Labeling Used Oil

- Containers and aboveground tanks used to store [used oil](#) shall be labeled or marked clearly with the words “**Used Oil.**”
- Fill pipes used to transfer [used oil](#) to underground storage tanks shall be labeled or marked clearly with the words “**Used Oil.**”

Glass Box Receptacles

Requirements

Note: The intent of the glass box receptacles is to safely segregate non-regulated glass from ordinary trash. Laboratory glassware (intact or broken) and empty glass containers may be placed in the glass boxes. However, empty glass containers must meet the following definition as found in this Chapter.

Members of the Workforce may place empty glass containers that held any chemical or hazardous waste, except a substance identified as an [acute hazardous waste](#), if **both** of following criteria are met:

- All contents have been removed that can be removed using the practices commonly employed to remove material from that type of container, such as pumping, pouring, or aspirating, **and**
- No more than 3% by weight of the total capacity of the container remains in the container, or
- No more than 2.5 centimeters (one inch) of residue remains on the bottom of the container or inner liner.

Containers with a capacity of 5 gallons or less that meet the above criteria may be thrown in the glass boxes. Empty containers with a capacity of **greater than 5 gallons** shall be submitted for disposal on a [WDDR](#). Those containers shall be marked with the words "Empty Container" and the disposal request and line item numbers.

Containers that held a substance identified as an [acute hazardous waste](#) shall be regarded as hazardous waste and may not be placed in the glass boxes.

Items prohibited for placement in a glass box include:

- Glass containers that do not meeting the definition of empty as described in this Chapter.
- Incandescent light bulbs that are to be managed as hazardous waste and must be submitted on a [WDDR](#).

- Fluorescent light bulbs (intact or broken) which have been determined not to be hazardous waste except as noted below, however, they shall be labeled with a hazardous waste label with the words "hazardous waste" cut off and submitted for disposal (recycling) on a [WDDR](#). Circular or U-shaped waste fluorescent light bulbs shall be managed as hazardous waste and submitted on a WDDR.
- Non-glass items such as regular trash, PPE, cans, etc.
- All liquids.



WASTES WITH NO DISPOSAL PATH

Requirements

Members of the Workforce who are [owners](#) or generators of hazardous waste shall:

- Request approval from DOE prior to generating any waste with no disposal path. Contact your [Division ES&H Team](#) environmental protection representative for assistance in the approval process and in determining if the waste has no disposal path.
- Identify waste with no disposal path by projecting the type and quantities of waste likely to be generated from a new project or process (see "Examples of Waste with No Disposal Path" in [Attachment 19A-6](#), "Approval Request Process.")



Members of the Workforce who are [owners](#) or generators and their [Division ES&H Team](#) environmental protection representative shall complete an approval request package as required by Attachment 19A-6, "Approval Request Process" if a waste with no disposal path is identified.

Approval to generate a waste with no disposal path is granted on an annual basis, therefore, Members of the Workforce shall review and resubmit the request every year that a waste with no disposal path is generated, unless a disposal path becomes available.



WASTE COMPATIBILITY AND SEGREGATION

Requirements

Hazardous Waste

Members of the Workforce who are [owners](#) or [generators](#) shall:

- Segregate [incompatible waste](#) by placing it in separate containers. To determine potential incompatibilities of chemicals, see [Attachment 19A-2](#), "Examples of Potentially Incompatible Waste," the relevant [Material Safety Data Sheet\(s\)](#) (MSDSs), or contact the appropriate [Division ES&H Team](#) environmental protection representative for assistance.

Explosive Waste

Members of the Workforce who are [owners](#) or generators of explosive waste shall:

- Physically segregate the waste into the following waste categories:
 - Articles that contain explosives
 - Bulk explosive substances
 - Solid and liquid waste items that are contaminated with explosives

Members of the Workforce while segregating explosive waste into the required categories specified above, shall further segregate dissimilar items within the same category by waste type:

- Waste articles that contain explosives shall be segregated by identical type, such as RP-2 detonators.
- Waste bulk substances shall be segregated by explosive type.
- Waste solid items contaminated with explosives, such as wipes, shall be segregated from other explosive-contaminated solid items, such as filters.

- Waste solvents contaminated with explosives shall be segregated by solvent type and explosive type.

Guidance

Members of the Workforce who are waste [owners](#) or generators should observe the following guidelines when segregating [hazardous waste](#):

- Segregate containers of incompatible hazardous waste by placing them in separate cabinets or secondary containment.
- Avoid combining different waste (even if they are compatible) in the same [primary container](#). Combining different waste streams may generate more disposal costs and may limit the opportunity for disposal.

Note: In some cases where different types of waste are compatible and have the same or very similar physical and chemical properties and contaminants, it is acceptable to combine these wastes in the same container provided that the waste generator maintains a SF 2001-WAL, "Waste Addition Log" ([Word file/ Acrobat file](#)). Contact the appropriate [Division ES&H Team](#) environmental protection representative for assistance.

*SATELLITE ACCUMULATION POINT (SAP)

Requirements

Members of the Workforce who are waste [owners](#) or generators shall:

- Accumulate primary containers of hazardous waste at a satellite accumulation point (SAP).

Note: Every location where hazardous waste is initially accumulated is, at a minimum, a SAP and is subject to all requirements of this section, regardless of the type of hazardous waste being stored.

The SAP shall be:

- Under the control of the owner or generator of the waste in storage at the SAP.
- Located at or near the point of waste generation. If this conflicts with any other requirement, contact the appropriate [Division ES&H Team](#) environmental protection representative for guidance.
- Located at least 20 feet from security fences.

- Waste to be picked up by the hazardous waste management facility (HWMF) must remain at the SAP and not moved to another location. If waste must be moved from the SAP for pickup, it must be coordinated with HWMF personnel so that the movement and pickup are concurrent.

Waste [owners](#) or generators shall **not**:

- Accept waste from other waste [owners](#) or generators.
- Submit waste to other waste owners or generators.
- Combine waste from other SAPs.

Guidance

Because the size and boundaries of a SAP are flexible and depend upon an owner's or generator's waste type, container, and work area, [owners](#) or generators should contact their [Division ES&H Team](#) environmental protection representative for assistance when establishing a SAP.

Note: SAPs can vary in size from a single plastic bag on a work bench to several containers in a dedicated room.

[Owners](#) or generators who would like to accept waste from other owners or generators should consider establishing a less-than-90-day accumulation area.

Waste owners or generators should contact the appropriate Division ES&H Team environmental protection representative for additional information regarding less-than-90-day accumulation areas (see [Attachment 19A-1](#), "Managing Hazardous Waste at a Less-Than-90-Day Accumulation Area").



CONTAINERS

Requirements

Hazardous Waste

Members of the Workforce who are waste [owners](#) or [generators](#) shall:

- Place [hazardous waste](#) inside an appropriate container at the time it is generated.
- An appropriate container shall be:
 - [Chemically compatible](#) with the waste.
 - In good condition and is leak free. A container in good condition has no dents, creases, bulges, or corrosion that would compromise the integrity of the container. Minor dents and/or surface corrosion are acceptable.
 - Closed, except to actively add or remove waste. A [closed container](#) will not allow any waste to escape into the environment.
 - Free of external chemical contamination (i.e., all waste shall be inside its container).

Explosive Waste

When placing explosive hazardous waste in containers, waste generators shall also comply with all compatibility and container requirements in [CPR400.1.1.31/MN471011](#), *Sandia Explosives Safety Manual*, and observe the following requirements:

- Explosive waste shall be placed inside antistatic [primary containers](#), such as Velostat™ bags or pill boxes, unless it will not fit.
- Primary containers of explosive waste shall be placed inside Sandia-approved explosive transportation (outer) containers, which shall also be in accordance with

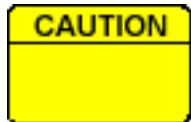
CPR400.1.1.31/MN471011, *Sandia Explosives Safety Manual*.

Note: More than one primary container may be placed inside a transportation container, but only if all compatibility requirements are met.

Guidance

Waste [owners](#) or generators should observe the following guidelines:

- Collect liquid waste in rigid closed-top containers, such as bottles, jugs, or closed head drums.
- Place solid waste in non-rigid containers, such as plastic bags or boxes per established container requirements.



[Owners](#) or generators should exercise caution when using Ziplock[®] and similar bags as containers for volatile waste because internal pressure may inadvertently open the bag. Avoid combining liquid and solid waste in the same primary container.

- Provide secondary containment for waste that could enter the environment through sewers, drains, or at outside SAPs when leaked or spilled.

Note: Explosive waste should **not** be placed in glass containers, nor should the waste contain glass or hypodermic needles. Combining different waste streams may generate more disposal costs and may limit the opportunity for disposal.

LABELS

Requirements

Hazardous Waste

Members of the Workforce who are waste [owners](#) or generators shall:

- Immediately apply a Hazardous Waste Label (see Attachment 19A-4, "Sample

Hazardous Waste Labels" [[Word file](#)/[Acrobat file](#)]) when non-explosive hazardous waste is first placed inside a primary container.

- Complete each field on the label as follows:
 - **Accumulation start date.** This field is optional unless time-sensitive chemicals are being managed, in which case complete this field and include the shelf life expiration date.
 - **Full date.** This field is optional unless the applicable volume limit is exceeded, in which case see "[Volume Limit](#)."
 - **Contents.** Accurately describe the waste inside the primary container, including specific chemical names and all contaminants.
 - **Org.** Enter the organization number of the person who generated the waste.
 - **Phone.** Enter the phone number of the person who generated the waste.
 - **Req. No.** When the waste item is submitted for disposal, enter the disposal request number and [line item number](#).




Explosive Waste

Members of the Workforce who are waste [owners](#) or generators shall:

- Immediately apply an Explosive Hazardous Waste Label (see Attachment 19A-5, "Sample Explosive Hazardous Waste Label" [[Word file](#)/[Acrobat file](#)]) when explosive waste is first placed inside a primary container.

- Complete each field on the label as follows:
 - **Contents.** Accurately describe the waste inside the primary container, including the name(s) of the explosives present and all chemical contaminants.
 - **UNO Classification of Waste.** Enter the original or most appropriate United Nations Organization (UNO) hazard classification and compatibility group for the waste inside the primary container. It is vital that the correct UNO hazard





classification and compatibility group is assigned. Contact the appropriate [Division ES&H Team](#) explosives safety representative for assistance.

- **N.E.W.** Enter the total net weight of the explosives present in the primary container.
- **Gross Quantity.** Enter the total weight of the waste.
- **Generator's Org. No./Phone No.** Enter the organization and phone numbers of the person who generated the waste.
- **Start Date.** This field is optional.
- **EWDR & Item No.** When the waste is submitted for disposal, enter the number from the [Explosive Waste Disposal Request Form \(EWDR\)](#) or the TU number, as appropriate.




Label Disposition

Members of the Workforce who are [owners](#) or generators shall not dispose of red and white "Hazardous Waste" or "Explosive Hazardous Waste" labels in the normal office trash unless the words "Hazardous Waste" or "Explosive Hazardous Waste" have been removed or obliterated.

Guidance

Primary containers are often placed in [outer containers](#), such as a plastic bag of contaminated wipes placed in a step can or explosive waste in a red ammunition can. When this occurs, waste generators should, at a minimum, mark or label the outer container with the words "Hazardous Waste."



Permanent or indelible ink should be used on containers of hazardous waste especially those stored at outside SAP locations. Labels should be checked periodically to ensure continued legibility.

VOLUME LIMITS

Requirements

Members of the Workforce who are waste [owners](#) and [generators](#) shall limit the total volume of hazardous and [acute hazardous waste](#) stored at a satellite accumulation point (SAP), as follows:

- Hazardous waste accumulated at a SAP is limited to 55 gallons.
- [Acute hazardous waste](#) accumulated at a SAP is limited to 1 quart.

If the total volume of waste at a SAP exceeds either the 55-gallon or 1-quart volume limit, waste owners or generators shall:

- Mark the excess of the applicable limit with the date the volume limit was exceeded.
- Remove within three [calendar days](#), by requesting a three-day pickup, the excess of the applicable limit. The request for a three-day pickup shall be initiated as soon as the volume limit is exceeded by completing the appropriate [WDDR](#) disposal request and checking the box for a "Volume Limit pickup."

DISPOSAL REQUEST

Requirements

Members of the Workforce who are waste [owners](#) or [generators](#) shall:

- Request disposal of waste on or before:
 - The applicable volume limit is exceeded.
 - The generator's status or assignment changes such that the waste is no longer [under the control of](#) the operator.
- Provide sufficient waste characterization information as requested and necessary



for Hazardous Waste Management Facility personnel to handle, transport, and disposition their waste.





- Certify that the information they provide on waste disposal request documentation is true and correct to the best of their knowledge and that they are ultimately responsible for the accuracy of that information.
- Request disposal of waste using a [WDDR](#) by linking to the Disposal Process website.
 - Do **not** add any additional waste to any primary container that has been submitted for disposal.
 - Complete the field on the Hazardous Waste Label of each container submitted for disposal by entering the Disposal Request Number and line item number in the appropriate field. The WDDR does not have the line items numbered. Use "1" for the item listed on the first line, "2" for the item listed on the second line, etc.



Waste generators shall use one of the following processes to request disposal of explosive hazardous waste.

Explosives Inventory System	Explosive Waste Disposal Request Form (EWDR)
1. Select "Component Control" from the "Component" pull-down menu.	1. Obtain an EWDR (see Attachment 19A-6 [Word file/ Acrobat file]) through JIT.
2. Enter the TU number to be declared waste.	2. Complete all applicable fields using the instructions on the cover sheet of the EWDR.




 <p>3. Select "Explosives Waste Request" from the "Components" pull-down menu.</p>	<p>3. Submit the EWDR to the Hazardous Waste Management Facility (HWMF), MS 1117.</p>
<p>4. Enter the "Quantity to Put in Explosives Waste" on the partial screen.</p>	<p>4. Do not add waste to a primary container that has been submitted for disposal.</p>
 <p>5. Complete each field. For waste explosive articles, review the constituents list to ensure that it accurately reflects the actual waste.</p>	<p>5. Complete the field on the Explosive Hazardous Waste Label of each container submitted for disposal by entering the EWDR and line item number in the appropriate field.</p>
 <p>6. Print the completed Explosive Waste Disposal Request (EWDR).</p>	
<p>7. Obtain the signatures of the owner or the generator on the generator certification.</p>	
 <p>8. Mail the EWDR to the Hazardous Waste Management Facility (HWMF), MS 1117.</p>	

Guidance

Members of the Workforce who are [owners](#) or generators should retain printed copies of WDDRs and copies of signed EWDRs in their records for a period of one year.

*ELEMENTARY NEUTRALIZATION


Requirements



A hazardous waste exhibiting *only* the characteristic of corrosivity (40 CFR 261.22 (a) (1)) with a pH < 2 or a pH > 12.5 may be neutralized in an elementary neutralization unit as a precursor to being discharged into the City of Albuquerque sewer system. Corrosive hazardous waste that has other RCRA characteristics or constituents may not be rendered non-RCRA by elementary neutralization. A permit must be obtained from the Environmental Management Department (6331) - Water Quality Group prior to neutralization and discharge. Contact the appropriate [Division ES&H Team](#) environmental protection representative before any waste is generated or neutralized.

Because a hazardous waste is being generated, the following RCRA requirements of 40 CFR 262.34 (a) would be applicable prior to neutralization:

1. [Labeling](#) as required by this section if the corrosive waste is stored in a container or tank prior to introduction into the elementary neutralization unit;
2. The one time Land Disposal Restriction (LDR) notification requirement of 40 CFR 268.7(a)(7); and
3. The records maintenance requirements of 40 CFR 268.7(a)(6).



Contact the appropriate [Division ES&H Team](#) for LDR notification and recordkeeping requirements.

The one-time LDR notification describing such generation, subsequent exclusion from the definition of hazardous or solid waste or exemption from RCRA Subtitle C regulation, and the disposition of the waste, must be in the facility's on-site file which performs the neutralization.

Note: Should the neutralized waste be discharged to other than the Albuquerque sewer

conveyance system or managed in any other way, additional RCRA requirements become applicable (e.g., development of a waste analysis plan and submittal of a certification to the NMED). Also, because a chemical waste is being generated the requirements of this Chapter are applicable. In addition, any discharge to the sewer conveyance system must be coordinated with Department 6331.

RELATED HAZARDS AND ACTIVITIES

Other hazards or activities related to [hazardous waste](#) accumulation and management are included in the following table. For more information on these hazards or activities, contact the appropriate [Division ES&H Team](#) environmental protection representative.

Hazards/Activities	Reference
Recycling	Section 4P , "Housekeeping" CPR500.2.3, <i>Property/Assets User's Manual</i> , "Identifying and Handling Excess Property."
Chemical exchange	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Lead bank	Section 10L , "Management of Excess Metallic Lead"
Chemical handling hazards	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan" CPR400.1.1.24/GN470094 , <i>Handling Chemicals at SNL/CA</i>
Safe disposal of non-chemical waste	Section 4P , "Housekeeping"

REFERENCES

Requirements Source Documents

[40 CFR 261.3](#), *Definition of Hazardous Waste*.

[40 CFR 261.7](#), *Residues of Hazardous Waste in Empty Containers*.

[40 CFR 261.33](#), *Discarded Commercial Chemical Products, Off-specification Species, Container Residues, and Spill Residues Thereof*.

[40 CFR 262.11](#), *Hazardous Waste Determination*.

[40 CFR 262.34](#), *Accumulation Time*.

[40 CFR 265.171](#), *Condition of Containers*.

[40 CFR 265.172](#), *Compatibility of Waste With Container*.

[40 CFR 265.173](#), *Management of Containers*.

40 CFR 265, Appendix V, *Examples of Potentially Incompatible Waste*.

42 USC 6901, et seq., [Resource Conservation and Recovery Act of 1976](#).

42 USC 13106 et seq., [Pollution Prevention Act of 1990](#).

Related Documents

LLNL, *LLNL Explosives Handbook*, Livermore, California, January 31, 1985.

SNL, EP-001, *Contingency Plan for Kauai Test Facility Hazardous Waste Management*.

SNL, [CPR400.1.1.37/GN470075](#), *Guidelines for Waste Generators at SNL/CA*.

SNL, [CPR400.1.1.31/MN471011](#), *Sandia Explosives Safety Manual*.

SNL, SP473341, *Chemical Waste Management at TTR*.

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*SECTION 1B – WHAT IS THE SCOPE

Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)

MN471001, Issue L

Revision Date: [November 04, 2004](#), Replaces Document Dated: September 27, 2000

Review Date: November 02, 2004

Administrative Changes: September 14, 2005, and [April 20, 2007](#)

* Indicates a substantive change

- [*Sandia's ES&H Program](#)
 - [*References](#)
 - Attachments
 - [*1B-1](#) - Site Premises Chart
-

*SANDIA'S ES&H PROGRAM

Applicability

Sandia's ES&H Program cuts across all organizational and project lines. This program applies to all facilities, operations, and activities, and to all Sandia [employees](#) at [Sandia-controlled premises](#), unless stated differently in this manual, [and at non-Sandia-controlled premises for offsite activities as indicated in "Offsite Activities."](#) [Contractors](#) are subject to this manual as follows:

- Contractors performing under [Sandia-directed contracts](#) are subject to the applicable sections and supplements of this manual.

- Contractors performing under [contractor-directed contracts](#) that include Standard Specification, [Section 01065, Environment, Safety, and Health for Construction and Service Contracts](#), or Section 01860, *Safety Provisions (at SNL/CA)*, are not subject to this manual.
- Contractors performing under contractor-directed contracts that do not include Standard Specification, [Section 01065, Environment, Safety, and Health for Construction and Service Contracts](#), or Section 01860, *Safety Provisions (at SNL/CA)*, are subject to this manual if they will be working on Sandia-controlled premises as their primary work site for at least one year.
- Contractors performing under contractor-directed contracts that do not include Standard Specification, [Section 01065, Environment, Safety, and Health for Construction and Service Contracts](#), or Section 01860, *Safety Provisions (at SNL/CA)*, whose primary work site is non-Sandia-controlled premises or whose primary work site is Sandia-controlled premises for less than one year, are subject to the requirements and procedures of their own company and are not governed by this manual unless otherwise stated in the terms of their contract.

Visitors and [roving personnel](#) are required to comply with the requirements stated in "[Roving Personnel and Visitors](#)," in Section 1D, "Who Does What."

*Offsite Activities

See [Attachment 1B-1](#), "Site Premises Chart" for site-specific information.

Requirements

Members of the Workforce shall follow the work-site requirements on non-Sandia-controlled premises as stated below:

Work Site	Requirements

<p>Premises controlled by DOE contractor with an approved Integrated Safety Management System (ISMS) Program, including Sandia's ISMS Program.</p>	<ul style="list-style-type: none"> ● Follow the ISMS of the organization responsible for directing the work. ● Identify and follow applicable site-specific DOE supplemental directives. <p>Note: The site's Prime Contractor can aid in identifying these requirements. For further assistance, contact Corporate Contracts and Policy Management Department (10730).</p>
<p>Premises where no DOE-approved ISMS exists (e.g., a university facility)</p>	<p>Follow Sandia's ISMS Program.</p>
<p>Premises used for telecommuting (e.g., home)</p>	<p>Follow safety requirements specified in:</p> <ul style="list-style-type: none"> ● “Safety, Accidents, and Insurance” in CPR300.6.30, Telecommuting, Section 4.0, “Process Requirements.” ● Chapter 3, “Office Safety.” ● “Office Ergonomics” in Section 6V, “Ergonomics.”

Note: Sandia's interface with the Nuclear Weapons Production Complex is defined in the technical business practice document TBP-901, *Integrated Safety Process for Nuclear Weapons Operations and Facilities.*

Guidance

Members of the Workforce planning to work on non-Sandia-controlled premises should:

- Before work begins, negotiate work procedures with the host or the organization directing the work.

- Consider local hazards and special risks associated with work at the location, and incorporate them in the [primary hazard screening \(PHS\)](#) for the work.
- Consider special needs for communications, emergency response, and medical services if planned work will be conducted at a location that is remote from support facilities and services (regardless of whether it is on Sandia-controlled premises).

Members of the Workforce should see the following when planning travel:

- [International Travel Clinic \(ITC\) website](#) for contact information about foreign travel health questions and International S.O.S (ISOS) worldwide emergency response service.
- [Chapter 16](#), “Benefits and Health Services,” for information on [foreign travel immunizations](#).

*REFERENCES

Requirements Source Documents

DE-AC04-94AL85000, *Management and Operating Contract Between Sandia Corporation and DOE:*

- [Clause H-22](#), "Performance of Work at DOE Facilities and Sites Other Than Sandia National Laboratories."
- [Clause I-78](#), "Integration of Environment, Safety, and Health into Work Planning and Execution."

Implementing Documents

SNL, [CPR300.6.30](#), *Telecommuting*.

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

SNL, [CPRS400.1](#), *Environment, Safety and Health Policy Statement Requirement*.

SNL, Standard Specification, [Section 01065](#), *Environment, Safety and Health for Construction and Service Contracts*.

SNL/CA, Standard Specification, Section 01860, *Safety Provisions*.

Related Documents

SNL, [Contractor-Directed and Sandia-Directed Contract Definitions](#).

TBP-901, *Integrated Safety Process for Nuclear Weapons Operations and Facilities*.



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50 CFR 10 GENERAL PROVISIONS

SUBPART A -- INTRODUCTION

- § 10.1 Purpose of regulations.
- § 10.2 Scope of regulations.
- § 10.3 Other applicable laws.
- § 10.4 When regulations apply.

SUBPART B -- DEFINITIONS

- § 10.11 Scope of definitions.
- § 10.12 Definitions.
- § 10.13 List of Migratory Birds.

SUBPART C -- ADDRESSES

- § 10.21 Director.
- § 10.22 Law enforcement offices.

AUTHORITY: 18 U.S.C. 42; 16 U.S.C. 703-712; 16 U.S.C. 668a-d; 19 U.S.C. 1202, 16 U.S.C. 1531-1543; 16 U.S.C. 1361-1384, 1401-1407; 16 U.S.C. 742a-742j-1; 16 U.S.C. 3371-3378.

SUBPART A -- INTRODUCTION

§ 10.1 Purpose of regulations.

The regulations of this Subchapter B are promulgated to implement the following statutes enforced by the U.S. Fish and Wildlife Service which regulate the taking, possession, transportation, sale, purchase, barter, exportation, and importation of wildlife:

- Lacey Act, 18 U.S.C. 42.
- Lacey Act Amendments of 1981, 16 U.S.C. 3371-3378.
- Migratory Bird Treaty Act, 16 U.S.C. 703-712.
- Bald and Golden Eagle Protection Act, 16 U.S.C. 668a-668d.
- Endangered Species Act of 1973, 16 U.S.C. 1531-1543.
- Tariff Classification Act of 1962, 19 U.S.C. 1202, [Schedule I, Part 15D, Headnote 2(d), T.S.U.S.].
- Fish and Wildlife Act of 1956, 16 U.S.C. 742a-742j-1.
- Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1384, 1401-1407.

SOURCE: [38 FR 22015, Aug. 15, 1973, as amended at 53 FR 6649, Mar. 2, 1988]

§ 10.2 Scope of regulations.

The various parts of this subchapter B are interrelated, and particular note should be taken that the parts must be construed with reference to each other. SOURCE: 38 FR 22015, Aug. 15, 1973.

§ 10.3 Other applicable laws.

No statute or regulation of any State shall be construed to relieve a person from the restrictions, conditions, and requirements contained in this subchapter B. In addition, nothing in this subchapter B, nor any permit issued under this subchapter B, shall be construed to relieve a person from any other requirements imposed by a statute or regulation of any State or of the United States, including any applicable health, quarantine, agricultural, or customs laws or regulations, or other Service enforced statutes or regulations. SOURCE: 38 FR 22015, Aug. 15, 1973.

§ 10.4 When regulations apply.

The regulations of this subchapter B shall apply to all matters arising after the effective date of such regulations, with the following exceptions:

(a) Civil penalty proceedings. Except as otherwise provided in § 11.25, the civil penalty assessment procedures contained in this subchapter B shall apply only to any proceeding instituted by notice of violation dated subsequent to the effective date of these regulations, regardless of when the act or omission which is the basis of a civil penalty proceeding occurred.

(b) Permits. The regulations in this subchapter B shall apply to any permit application received after the effective date of the appropriate regulations in this subchapter B and, insofar as appropriate, to any permit which is renewed after such effective date. SOURCE: [38 FR 22015, Aug. 15, 1973, as amended at 39 FR 1159, Jan. 4, 1974]

SUBPART B -- DEFINITIONS

§ 10.11 Scope of definitions.

In addition and subject to definitions contained in applicable statutes and subsequent parts or sections of this subchapter B, words or their variants shall have the meanings ascribed in this subpart. Throughout this subchapter B words in the singular form shall include the plural, words in the plural form shall include the singular, and words in the masculine form shall include the feminine.

SOURCE: 38 FR 22015, Aug. 15, 1973.

§ 10.12 Definitions.

Aircraft means any contrivance used for flight in the air.

Amphibians means a member of the class, Amphibia, including, but not limited to, frogs, toads, and salamanders; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Animal means an organism of the animal kingdom, as distinguished from the plant kingdom; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Birds means a member of the class, Aves; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Country of exportation means the last country from which the animal was exported before importation into the United States.

Country of origin means the country where the animal was taken from the wild, or the country of natal origin of the animal.

Crustacean means a member of the class, Crustacea, including but not limited to, crayfish, lobsters, shrimps, crabs, barnacles, and some terrestrial forms; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Director means the Director of the United States Fish and Wildlife Service, Department of the Interior, or his authorized representative.

Endangered wildlife means any wildlife listed in § 17.11 or § 17.12 of this subchapter.

Fish means a member of any of the following classes:

- (1) Cyclostomata, including, but not limited to, hagfishes and lampreys;
- (2) Elasmobranchii, including but not limited to, sharks, skates, and rays; and

(3) Pisces, including but not limited to trout, perch, bass, minnows, and catfish; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Fish or wildlife means any wild animal, whether alive or dead, including without limitation any wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, whether or not bred, hatched, or born in captivity, and including any part, product, egg, or offspring thereof.

Foreign commerce includes, among other things, any transaction (1) between persons within one foreign country, or (2) between persons in two or more foreign countries, or (3) between a person within the United States and a person in one or more foreign countries, or (4) between persons within the United States, where the fish or wildlife in question are moving in any country or countries outside the United States.

Fossil means the remains of an animal of past geological ages which has been preserved in the earth's crust through mineralization of the object.

Import means to land on, bring into, or introduce into, or attempt to land on, bring into, or introduce into any place subject to the jurisdiction of the United States, whether or not such landing, bringing, or introduction constitutes an importation within the meaning of the tariff laws of the United States.

Injurious Wildlife means any wildlife for which a permit is required under subpart B of part 16 of this subchapter before being imported into or shipped between the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any possession of the United States.

Mammal means a member of the class, Mammalia; including any part, product, egg, or offspring, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Migratory bird means any bird, whatever its origin and whether or not raised in captivity, which belongs to a species listed in § 10.13, or which is a mutation or a hybrid of any such species, including any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof.

Migratory game birds: See § 20.11 of this subchapter.

Mollusk means a member of the phylum, Mollusca, including but not limited to, snails, mussels, clams, oysters, scallops, abalone, squid, and octopuses; including any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

Permit means any document designated as a "permit," "license," "certificate," or any other document issued by the Service to authorize, limit, or describe activity and signed by an authorized official of the Service.

Person means any individual, firm, corporation, association, partnership, club, or private body, any one or all, as the context requires.

Plant means any member of the plant kingdom, including seeds, roots and other parts thereof.

Possession means the detention and control, or the manual or ideal custody of anything which may be the subject of property, for one's use and enjoyment, either as owner or as the proprietor of a qualified right in it, and either held personally or by another who exercises it in one's place and name. Possession includes the act or state of possessing and that condition of facts under which one can exercise his power over a corporeal thing at his pleasure to the exclusion of all other persons. Possession includes constructive possession which means not actual but assumed to exist, where one claims to hold by virtue of some title, without having actual custody.

Public as used in referring to museums, zoological parks, and scientific or educational institutions, refers to such as are open to the general public and are either established, maintained, and operated as a governmental service or are privately endowed and organized but not operated for profit.

Reptile means a member of the class, Reptilia, including but not limited to, turtles, snakes, lizards, crocodiles, and alligators; including any part, product, egg, or offspring thereof, or the dead body or parts thereof, whether or not included in a manufactured product or in a processed food product.

Secretary means the Secretary of the Interior or his authorized representative.

Service means the United States Fish and Wildlife Service, Department of the Interior.

Shellfish means an aquatic invertebrate animal having a shell, including, but not limited to, (a) an oyster, clam, or other mollusk; and (b) a lobster or other crustacean; or any part, product, egg, or offspring thereof, or the dead body or parts thereof (excluding fossils), whether or not included in a manufactured product or in a processed food product.

State means any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, and Guam.

Take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect. (With reference to marine mammals, see Part 18 of this subchapter.)

Transportation means to ship, convey, carry or transport by any means whatever, and deliver or receive for such shipment, conveyance, carriage, or transportation.

United States means the several States of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the Virgin Islands, and Guam.

Whoever means the same as person.

Wildlife means the same as fish or wildlife.

SOURCE: [38 FR 22015, Aug. 15, 1973, as amended at 42 FR 32377, June 24, 1977; 42 FR 59358, Nov. 16, 1977; 45 FR 56673, Aug. 25, 1980; 50 FR 52889, Dec. 26, 1985]

§ 10.13 List of Migratory Birds.

The following is a list of all species of migratory birds protected by the Migratory Bird Treaty Act (16 U.S.C. 703-711) and subject to the regulations on migratory birds contained in this subchapter B of title 50 CFR. The species listed are those protected by the Convention for the Protection of Migratory Birds, August 16, 1916, United States-Great Britain (on behalf of Canada), 39 Stat. 1702, T.S. No. 628; the Convention for the Protection of Migratory Birds and Game Mammals, February 7, 1936, United States-Mexico, 50 Stat. 1311, T.S. No. 912; the Convention for the Protection of Migratory Birds and Birds in Danger of Extinction, and Their Environment, March 4, 1972, United States-Japan, 25 U.S.T. 3329, T.I.A.S. No. 7990; and the Convention for the Conservation of Migratory Birds and Their Environment, United States-U.S.S.R., November 26, 1976, 92 Stat. 3110, T.I.A.S. 9073, 16 U.S.C. 703, 712. The species are listed two ways. In the first part of the List species are arranged

alphabetically by English (common) name groups, with the scientific name following the English (common) name. All species of ducks are listed together under the heading "Ducks". In the second part of the List, species are listed by scientific name arranged in taxonomic order. Taxonomy and nomenclature follows the American Ornithologists' Union's Check-list of North American Birds (6th Edition, 1983).

I. Alphabetical Listing

Accentor, Siberian, *Prunella montanella*

Albatross:

- Black-footed, *Diomedea nigripes*
- Laysan, *Diomedea immutabilis*
- Short-tailed, *Diomedea albatrus*
- Yellow-nosed, *Diomedea chlororhynchos*

Anhinga, *Anhinga anhinga*

Ani:

- Groove-billed, *Crotophaga sulcirostris*
- Smooth-billed, *Crotophaga ani*

Auklet:

- Cassin's, *Ptychoramphus aleuticus*
- Crested, *Aethia cristatella*
- Least, *Aethia pusilla*
- Parakeet, *Cyclorhynchus psittacula*
- Rhinoceros, *Cerorhinca monocerata*
- Whiskered, *Aethia pygmaea*

Avocet, American, *Recurvirostra americana*

Barn-Owl, Common, *Tyto alba*

Beardless-Tyrannulet, Northern, *Camptostoma imberbe*

Becard, Rose-throated, *Pachyrhamphus aglaiae*

Bittern:

- American, *Botaurus lentiginosus*
- Chinese, *Ixobrychus sinensis*
- Least, *Ixobrychus exilis*
- Schrenk's, *Ixobrychus eurhythmus*

Black-Hawk, Common, *Buteogallus anthracinus*

Blackbird:

- Brewer's, *Euphagus cyanocephalus*
- Red-winged, *Agelaius phoeniceus*
- Rusty, *Euphagus carolinus*
- Tawny-shouldered, *Agelaius humeralis*
- Tricolored, *Agelaius tricolor*
- Yellow-headed, *Xanthocephalus xanthocephalus*
- Yellow-shouldered, *Agelaius xanthomus*

Bluebird:

- Eastern, *Sialia sialis*
- Mountain, *Sialia currucoides*
- Western, *Sialia mexicana*

Bluethroat, *Luscinia svecica*

Bobolink, *Dolichonyx oryzivorus*

Booby:

- Blue-footed, *Sula nebouxii*

Brown, *Sula leucogaster*

Masked, *Sula dactylatra*

Red-footed, *Sula sula*

Brambling, *Fringilla montifringilla*

Brant, *Branta bernicla*

Bufflehead (see DUCKS)

Bullfinch:

- Eurasian, *Pyrrhula pyrrhula*
- Puerto Rican, *Loxigilla portoricensis*

Bunting:

- Indigo, *Passerina cyanea*
- Lark, *Calamospiza melanocorys*
- Lazuli, *Passerina amoena*
- McKay's, *Plectrophenax hyperboreus*
- Painted, *Passerina ciris*
- Reed (see Reed-Bunting)
- Rustic, *Emberiza rustica*
- Snow, *Plectrophenax nivalis*
- Varied, *Passerina versicolor*

Bushtit, *Psaltriparus minimus*

Canvasback (see DUCKS)

Caracara, Crested, *Polyborus plancus*

Cardinal, Northern, *Cardinalis cardinalis*

Carib, Green-throated, *Eulampis holosericeus*

Catbird, Gray, *Dumetella carolinensis*

Chat, Yellow-breasted, *Icteria virens*

Chickadee (see Tit):

- Black-capped, *Parus atricapillus*
- Boreal, *Parus hudsonicus*
- Carolina, *Parus carolinensis*
- Chestnut-backed, *Parus rufescens*
- Mexican, *Parus sclateri*
- Mountain, *Parus gambeli*

Chuck-will's-widow, *Caprimulgus carolinensis*

Condor, California, *Gymnogyps californianus*

Coot:

- American, *Fulica americana*
- Caribbean, *Fulica caribaea*
- Eurasian, *Fulica atra*

Cormorant:

- Brandt's, *Phalacrocorax penicillatus*
- Double-crested, *Phalacrocorax auritus*
- Great, *Phalacrocorax carbo*
- Olivaceous, *Phalacrocorax olivaceus*
- Pelagic, *Phalacrocorax pelagicus*
- Red-faced, *Phalacrocorax urile*

Cowbird:

- Bronzed, *Molothrus aeneus*
- Brown-headed, *Molothrus ater*
- Shiny, *Molothrus bonariensis*

Crake:

- Corn, *Crex crex*
- Yellow-breasted, *Porzana flaviventer*

Crane:

Common, *Grus grus*
 Sandhill, *Grus canadensis*
 Whooping, *Grus americana*
 Creeper, Brown, *Certhia americana*

Crossbill:
 Red, *Loxia curvirostra*
 White-winged, *Loxia leucoptera*

Crow:
 American, *Corvus brachyrhynchos*
 Fish, *Corvus ossifragus*
 Hawaiian, *Corvus hawaiiensis*
 Mexican, *Corvus imparatus*
 Northwestern, *Corvus caurinus*
 White-necked, *Corvus leucognaphalus*

Cuckoo:
 Black-billed, *Coccyzus erythrophthalmus*
 Common, *Cuculus canorus*
 Hawk (see Hawk-Cuckoo)
 Lizard (see Lizard-Cuckoo)
 Mangrove, *Coccyzus minor*
 Oriental, *Cuculus saturatus*
 Yellow-billed, *Coccyzus americanus*

Curllew (see Whimbrel):
 Bristle-thighed, *Numenius tahitiensis*
 Eskimo, *Numenius borealis*
 Far Eastern, *Numenius madagascariensis*
 Least, *Numenius minutus*
 Long-billed, *Numenius americanus*

Dickcissel, *Spiza americana*

Dipper, American, *Cinclus mexicanus*
 Dotterel, Eurasian, *Charadrius morinellus*

Dove:
 Ground (see Ground-Dove)
 Inca, *Columbina inca*
 Mourning, *Zenaidura macroura*
 Quail (see Quail-Dove)
 White-tipped, *Leptotila verreauxi*
 White-winged, *Zenaidura asiatica*
 Zenaida, *Zenaidura macroura*

Dovekie, *Alle alle*

Dowitcher:
 Long-billed, *Limnodromus scolopaceus*
 Short-billed, *Limnodromus griseus*

DUCKS

American Black Duck, *Anas rubripes*
 Bufflehead, *Bucephala albeola*
 Canvasback, *Aythya valisineria*

Eider:
 Common, *Somateria mollissima*
 King, *Somateria spectabilis*
 Spectacled, *Somateria fischeri*

Steller's, *Polysticta stelleri*
 Gadwall, *Anas strepera*
 Garganey, *Anas querquedula*
 Goldeneye:
 Barrow's, *Bucephala islandica*
 Common, *Bucephala clangula*
 Harlequin Duck, *Histrionicus histrionicus*
 Hawaiian Duck, *Anas wyvilliana*
 Laysan Duck, *Anas laysanensis*
 Mallard, *Anas platyrhynchos*
 Masked Duck, *Oxyura dominica*

Merganser:
 Common, *Mergus merganser*
 Hooded, *Lophodytes cucullatus*
 Red-breasted, *Mergus serrator*

Mottled Duck, *Anas fulvigula*
 Oldsquaw, *Clangula hyemalis*

Pintail:
 Northern, *Anas acuta*
 White-cheeked, *Anas bahamensis*

Pochard:
 Baer's, *Aythya baeri*
 Common, *Aythya ferina*
 Redhead, *Aythya americana*
 Ring-necked Duck, *Aythya collaris*
 Ruddy Duck, *Oxyura jamaicensis*

Scaup:
 Greater, *Aythya marila*
 Lesser, *Aythya affinis*

Scoter:
 Black, *Melanitta nigra*
 Surf, *Melanitta perspicillata*
 White-winged, *Melanitta fusca*

Shoveler, Northern, *Anas clypeata*
 Smew, *Mergellus albellus*

Teal:
 Baikal, *Anas formosa*
 Blue-winged, *Anas discors*
 Cinnamon, *Anas cyanoptera*
 Falcated, *Anas falcata*
 Green-winged, *Anas crecca*

Tufted Duck, *Aythya fuligula*

Whistling-Duck:
 Black-bellied, *Dendrocygna autumnalis*
 Fulvous, *Dendrocygna bicolor*
 West Indian, *Dendrocygna arborea*

Wigeon:
 American, *Anas americana*
 Eurasian, *Anas penelope*
 Wood Duck, *Aix sponsa*

END OF DUCKS

Dunlin, *Calidris alpina*

Eagle:

Bald, *Haliaeetus leucocephalus*
 Golden, *Aquila chrysaetos*
 Sea (see Sea-Eagle)
 White-tailed, *Haliaeetus albicilla*

Egret:

Cattle, *Bubulcus ibis*
 Chinese, *Egretta eulophotes*
 Great, *Casmerodius albus*
 Plumed, *Egretta intermedia*
 Reddish, *Egretta rufescens*
 Snowy, *Egretta thula*

Eider (see DUCKS)

Elaenia, Caribbean, *Elaenia martinica*

Emerald, Puerto Rican, *Chlorostilbon maugaeus*

Euphonia, Antillean, *Euphonia musica*

Falcon:

Aplomado, *Falco femoralis*
 Peregrine, *Falco peregrinus*
 Prairie, *Falco mexicanus*

Fieldfare, *Turdus pilaris*

Finch:

Cassin's, *Carpodacus cassinii*
 House, *Carpodacus mexicanus*
 Purple, *Carpodacus purpureus*
 Rosy, *Leucosticte arctoa*

Flamingo, Greater, *Phoenicopterus ruber*

Flicker, Northern, *Colaptes auratus*

Flycatcher:

Acadian, *Empidonax vireescens*
 Alder, *Empidonax alnorum*
 Ash-throated, *Myiarchus cinerascens*
 Brown-crested, *Myiarchus tyrannulus*
 Buff-breasted, *Empidonax fulvifrons*
 Dusky, *Empidonax oberholseri*
 Dusky-capped, *Myiarchus tuberculifer*
 Fork-tailed, *Tyrannus savana*
 Gray, *Empidonax wrightii*
 Gray-spotted, *Muscicapa griseisticta*
 Great Crested, *Myiarchus crinitus*
 Hammond's, *Empidonax hammondii*
 Least, *Empidonax minimus*
 Narcissus, *Muscicapa narcissina*
 Nutting's, *Myiarchus nuttingi*
 Olive-sided, *Contopus borealis*
 Puerto Rican, *Myiarchus antillarum*
 Scissor-tailed, *Tyrannus forficatus*
 Sulphur-bellied, *Myiodynastes luteiventris*
 Vermilion, *Pyrocephalus rubinus*
 Western, *Empidonax difficilis*
 Willow, *Empidonax traillii*
 Yellow-bellied, *Empidonax flaviventris*

Frigatebird:

Great, *Fregata minor*

Magnificent, *Fregata magnificens*

Lesser, *Fregata ariel*

Fulmar, Northern, *Fulmarus glacialis*

Gadwall (see DUCKS)

Gallinule, Purple, *Porphyryla martinica*

Gannet, Northern, *Sula bassanus*

Garganey (see DUCKS)

Gnatcatcher:

Black-capped, *Poliophtila nigriceps*
 Black-tailed, *Poliophtila melanura*
 Blue-gray, *Poliophtila caerulea*

Godwit:

Bar-tailed, *Limosa lapponica*
 Black-tailed, *Limosa limosa*
 Hudsonian, *Limosa haemastica*
 Marbled, *Limosa fedoa*

Golden-Plover, Lesser, *Pluvialis dominica*

Goldeneye (see DUCKS)

Goldfinch:

American, *Carduelis tristis*
 Lawrence's, *Carduelis lawrencei*
 Lesser, *Carduelis psaltria*

Goose:

Barnacle, *Branta leucopsis*
 Bean, *Anser fabalis*
 Canada, *Branta canadensis*
 Emperor, *Chen canagica*
 Greater White-fronted, *Anser albifrons*
 Hawaiian, *Nesochen sandvicensis*
 Ross', *Chen rossii*
 Snow, *Chen caerulescens*

Goshawk, Northern, *Accipiter gentilis*

Grackle:

Boat-tailed, *Quiscalus major*
 Common, *Quiscalus quiscula*
 Great-tailed, *Quiscalus mexicanus*
 Greater Antillean, *Quiscalus niger*

Grasshopper-Warbler, Middendorff's, *Locustella ochotensis*

Grassquit:

Black-faced, *Tiaris bicolor*
 Yellow-faced, *Tiaris olivacea*

Grebe:

Eared, *Podiceps nigricollis*
 Horned, *Podiceps auritus*
 Least, *Tachybaptus dominicus*
 Pied-billed, *Podilymbus podiceps*
 Red-necked, *Podiceps grisegena*
 Western, *Aechmophorus occidentalis*

Greenfinch, Oriental, *Carduelis sinica*

Greenshank, Common, *Tringa nebularia*

Grosbeak:

Black-headed, *Pheucticus melanocephalus*
 Blue, *Guiraca caerulea*

- Crimson-collared, *Rhodotraupis celaeno*
 Eveing, *Coccothraustes vespertinus*
 Pine, *Pinicola enucleator*
 Rose-breasted, *Pheucticus ludovicianus*
 Yellow, *Pheucticus chrysoplepus*
- Ground-Dove:
 Common, *Columbina passerina*
 Ruddy, *Columbina talpacoti*
- Guillemot:
 Black, *Cepphus grylle*
 Pigeon, *Cepphus columba*
- Gull:
 Bonaparte's, *Larus philadelphia*
 California, *Larus californicus*
 Common Black-headed, *Larus ridibundus*
 Franklin's, *Larus pipixcan*
 Glaucous, *Larus hyperboreus*
 Glaucous-winged, *Larus glaucescens*
 Great Black-backed, *Larus marinus*
 Heermann's, *Larus heermanni*
 Herring, *Larus argentatus*
 Iceland, *Larus glaucoides*
 Ivory, *Pagophila eburnea*
 Laughing, *Larus atricilla*
 Lesser Black-backed, *Larus fuscus*
 Little, *Larus minutus*
 Mew, *Larus canus*
 Ring-billed, *Larus delawarensis*
 Ross', *Rhodostethia rosea*
 Sabine's, *Xema sabini*
 Slaty-backed, *Larus schistisagus*
 Thayer's, *Larus thayeri*
 Western, *Larus occidentalis*
 Yellow-footed, *Larus livens*
- Gyr Falcon, *Falco rusticolus*
 Harrier, Northern, *Circus cyaneus*
 Hawfinch, *Coccothraustes coccothraustes*
- Hawk:
 Asiatic Sparrow, *Accipiter gularis*
 Black (see Black-Hawk)
 Broad-winged, *Buteo platypterus*
 Cooper's, *Accipiter cooperii*
 Ferruginous, *Buteo regalis*
 Gray, *Buteo nitidus*
 Harris', *Parabuteo unicinctus*
 Hawaiian, *Buteo solitarius*
 Red-shouldered, *Buteo lineatus*
 Red-tailed, *Buteo jamaicensis*
 Rough-legged, *Buteo lagopus*
 Sharp-shinned, *Accipiter striatus*
 Short-tailed, *Buteo brachyurus*
 Swainson's, *Buteo swainsoni*
 White-tailed, *Buteo albicaudatus*
 Zone-tailed, *Buteo albonotatus*
- Hawk-Cuckoo, Hodgson's, *Cuculus fugax*
 Hawk-Owl, Northern, *Surnia ulula*
- Heron:
 Great Blue, *Ardea herodias*
 Green-backed, *Butorides striatus*
 Little Blue, *Egretta caerulea*
 Night (see Night-Heron)
 Pacific Reef, *Egretta sacra*
 Tricolored, *Egretta tricolor*
- Hoopoe, *Upupa epops*
 House-Martin, Common, *Delichon urbica*
 Hummingbird (see Carib, Emerald, Mango, Starthroat,
 Woodstar, Violet-ear):
 Allen's, *Selasphorus sasin*
 Anna's, *Calypte anna*
 Antillean Crested, *Orthorhynchus cristatus*
 Berylline, *Amazilia beryllina*
 Black-chinned, *Archilochus alexandri*
 Blue-throated, *Lampornis clemenciae*
 Broad-billed, *Cyanthus latirostris*
 Broad-tailed, *Selasphorus platycercus*
 Buff-bellied, *Amazilia yucatanensis*
 Calliope, *Stellula calliope*
 Costa's, *Calypte costae*
 Lucifer, *Calothorax lucifer*
 Magnificent, *Eugenes fulgens*
 Ruby-throated, *Archilochus colubris*
 Rufous, *Selasphorus rufus*
 Violet-crowned, *Amazilia violiceps*
 White-eared, *Hylocharis leucotis*
- Ibis:
 Glossy, *Plegadis falcinellus*
 Scarlet, *Eudocimus ruber*
 White, *Eudocimus albus*
 White-faced, *Plegadis chihi*
- Jabiru, *Jabiru mycteria*
 Jacana, Northern, *Jacana spinosa*
- Jaeger:
 Long-tailed, *Stercorarius longicaudus*
 Parasitic, *Stercorarius parasiticus*
 Pomarine, *Stercorarius pomarinus*
- Jay:
 Blue, *Cyanocitta cristata*
 Brown, *Cyanocorax morio*
 Gray, *Perisoreus canadensis*
 Gray-breasted, *Aphelocoma ultramarina*
 Green, *Cyanocorax yncas*
 Pinyon, *Gymnorhinus cyanocephalus*
 Scrub, *Aphelocoma coerulescens*
 Steller's, *Cyanocitta stelleri*
- Junco:
 Dark-eyed, *Junco hyemalis*
 Yellow-eyed, *Junco phaeonotus*
- Kestrel:

- American, *Falco sparverius*
 Eurasian, *Falco tinnunculus*
 Killdeer, *Charadrius vociferus*
 Kingbird:
 Cassin's, *Tyrannus vociferans*
 Couch's, *Tyrannus couchii*
 Eastern, *Tyrannus tyrannus*
 Gray, *Tyrannus dominicensis*
 Loggerhead, *Tyrannus caudifasciatus*
 Thick-billed, *Tyrannus crassirostris*
 Tropical, *Tyrannus melancholicus*
 Western, *Tyrannus verticalis*
 Kingfisher:
 Belted, *Ceryle alcyon*
 Green, *Chloroceryle americana*
 Ringed, *Ceryle torquata*
 Kinglet:
 Golden-crowned, *Regulus satrapa*
 Ruby-crowned, *Regulus calendula*
 Kiskadee, Great, *Pitangus sulphuratus*
 Kite:
 American Swallow-tailed, *Elanoides forficatus*
 Black, *Milvus migrans*
 Black-shouldered, *Elanus caeruleus*
 Hook-billed, *Chondrohierax uncinatus*
 Mississippi, *Ictinia mississippiensis*
 Snail, *Rostrhamus sociabilis*
 Kittiwake:
 Black-legged, *Larus tridactyla*
 Red-legged, *Larus brevirostris*
 Knot:
 Great, *Calidris tenuirostris*
 Red, *Calidris canutus*
 Lapwing, Northern, *Vanellus vanellus*
 Lark, Horned, *Eremophila alpestris*
 Limpkin, *Aramus guarauna*
 Lizard-Cuckoo, Puerto Rican, *Saurothera vieilloti*
 Longspur:
 Chestnut-collared, *Calcarius ornatus*
 Lapland, *Calcarius lapponicus*
 McCown's, *Calcarius mccownii*
 Smith's, *Calcarius pictus*
 Loon:
 Arctic, *Gavia arctica*
 Common, *Gavia immer*
 Red-throated, *Gavia stellata*
 Yellow-billed, *Gavia adamsii*
 Magpie:
 Black-billed, *Pica pica*
 Yellow-billed, *Pica nuttalli*
 Mallard (see DUCKS)
 Mango:
 Antillean, *Anthracothorax dominicus*
 Green, *Anthracothorax viridis*
 Martin:
 Caribbean, *Progne dominicensis*
 Cuban, *Progne cryptoleuca*
 Gray-breasted, *Progne chalybea*
 House (see House-Martin)
 Purple, *Progne subis*
 Meadowlark:
 Eastern, *Sturnella magna*
 Western, *Sturnella neglecta*
 Merganser (see DUCKS)
 Merlin, *Falco columbarius*
 Mockingbird, Northern, *Mimus polyglottos*
 Moorhen, Common, *Gallinula chloropus*
 Murre:
 Common, *Uria aalge*
 Thick-billed, *Uria lomvia*
 Murrelet:
 Ancient, *Synthliboramphus antiquus*
 Craver's, *Synthliboramphus craveri*
 Kittlitz's, *Brachyramphus brevirostris*
 Marbled, *Brachyramphus marmoratus*
 Xantus', *Synthliboramphus hypoleucus*
 Needletail, White-throated, *Hirundapus caudacutus*
 Night-Heron:
 Black-crowned, *Nycticorax nycticorax*
 Japanese, *Nycticorax goisagi*
 Malay, *Nycticorax melanolophus*
 Yellow-crowned, *Nycticorax violaceus*
 Nighthawk:
 Antillean, *Chordeiles gundlachi*
 Common, *Chordeiles minor*
 Lesser, *Chordeiles acutipennis*
 Nightjar:
 Buff-collared, *Caprimulgus ridgwayi*
 Jungle, *Caprimulgus indicus*
 Puerto Rican, *Caprimulgus noctitherus*
 Noddy:
 Black, *Anous minutus*
 Blue-gray, *Procelsterna cerulea*
 Brown, *Anous stolidus*
 Lesser, *Anous tenuirostris*
 Nutcracker, Clark's, *Nucifraga columbiana*
 Nuthatch:
 Brown-headed, *Sitta pusilla*
 Pygmy, *Sitta pygmaea*
 Red-breasted, *Sitta canadensis*
 White-breasted, *Sitta carolinensis*
 Oldsquaw (see DUCKS)
 Oriole:
 Altamira, *Icterus gularis*
 Audubon's, *Icterus graduacauda*
 Black-cowled, *Icterus dominicensis*
 Black-vented, *Icterus wagleri*
 Hooded, *Icterus cucullatus*

- Northern, *Icterus galbula*
 Orchard, *Icterus spurius*
 Scott's, *Icterus parisorum*
 Streak-backed, *Icterus pustulatus*
 Osprey, *Pandion haliaetus*
 Ovenbird, *Seiurus aurocapillus*
 Owl:
 Barn (see Barn-Owl)
 Barred, *Strix varia*
 Boreal, *Aegolius funereus*
 Burrowing, *Athene cunicularia*
 Elf, *Micrathene whitneyi*
 Flammulated, *Otus flammeolus*
 Great Gray, *Strix nebulosa*
 Great Horned, *Bubo virginianus*
 Hawk (see Hawk-Owl)
 Long-eared, *Asio otus*
 Pygmy (see Pygmy-Owl)
 Saw-whet (see Saw-Whet Owl)
 Screech (see Screech-Owl)
 Short-eared, *Asio flammeus*
 Snowy, *Nyctea scandiaca*
 Spotted, *Strix occidentalis*
 Oystercatcher:
 American, *Haematopus palliatus*
 Black, *Haematopus bachmani*
 Parula:
 Northern, *Parula americana*
 Tropical, *Parula pitayumi*
 Pauraque, Common, *Nyctidromus albigollis*
 Pelican:
 American White, *Pelecanus erythrorhynchos*
 Brown, *Pelecanus occidentalis*
 Petrel:
 Black-capped, *Pterodroma hasitata*
 Bonin, *Pterodroma hypoleuca*
 Bulwer's, *Bulweria bulwerii*
 Cook's, *Pterodroma cookii*
 Dark-rumped, *Pterodroma phaeopygia*
 Herald, *Pterodroma arminjoniana*
 Kermadec, *Pterodroma neglecta*
 Mottled, *Pterodroma inexpectata*
 Murphy's, *Pterodroma ultima*
 Storm (see Storm-Petrel)
 White-necked, *Pterodroma externa*
 Pewee:
 Greater, *Contopus pertinax*
 Lesser Antillean, *Contopus latirostris*
 Wood (see Wood-Pewee)
 Phainopepla, *Phainopepla nitens*
 Phalarope:
 Red, *Phalaropus fulicaria*
 Red-necked, *Phalaropus lobatus*
 Wilson's, *Phalaropus tricolor*
 Phoebe:
 Black, *Sayornis nigricans*
 Eastern, *Sayornis phoebe*
 Say's, *Sayornis saya*
 Pigeon:
 Band-tailed, *Columba fasciata*
 Plain, *Columba inornata*
 Red-billed, *Columba flavirostris*
 Scaly-naped, *Columba squamosa*
 White-crowned, *Columba leucocephala*
 Pintail (see DUCKS)
 Pipit:
 Pechora, *Anthus gustavi*
 Red-throated, *Anthus cervinus*
 Sprague's, *Anthus spragueii*
 Tree (see Tree-Pipit)
 Water, *Anthus spinoletta*
 Plover:
 Black-bellied, *Pluvialis squatarola*
 Common Ringed, *Charadrius hiaticula*
 Golden (see Golden-Plover)
 Great Sand, *Charadrius leschenaultii*
 Little Ringed, *Charadrius dubius*
 Mongolian, *Charadrius mongolus*
 Mountain, *Charadrius montanus*
 Piping, *Charadrius melodus*
 Semipalmated, *Charadrius semipalmatus*
 Snowy, *Charadrius alexandrinus*
 Wilson's, *Charadrius wilsonia*
 Pochard (see DUCKS)
 Poorwill, Common, *Phalaenoptilus nuttallii*
 Puffin:
 Atlantic, *Fratercula arctica*
 Horned, *Fratercula corniculata*
 Tufted, *Fratercula cirrhata*
 Pygmy-Owl:
 Ferruginous, *Glaucidium brasilianum*
 Northern, *Glaucidium gnoma*
 Pyrrhuloxia, *Cardinalis sinuatus*
 Quail-Dove:
 Bridled, *Geotrygon mystacea*
 Key West, *Geotrygon chrysis*
 Ruddy, *Geotrygon montana*
 Rail:
 Black, *Laterallus jamaicensis*
 Clapper, *Rallus longirostris*
 King, *Rallus elegans*
 Sora (see Sora)
 Virginia, *Rallus limicola*
 Yellow, *Coturnicops noveboracensis*
 Raven:
 Chihuahuan, *Corvus cryptoleucus*
 Common, *Corvus corax*
 Razorbill, *Alca torda*

Redhead (see DUCKS)	Puerto Rican, <i>Otus nudipes</i>
Redpoll:	Western, <i>Otus kennicottii</i>
Common, <i>Carduelis flammea</i>	Whiskered, <i>Otus trichopsis</i>
Hoary, <i>Carduelis hornemanni</i>	Sea-Eagle, Steller's, <i>Haliaeetus pelagicus</i>
Redshank, Spotted, <i>Tringa erythropus</i>	Seedeater, White-collared, <i>Sporophila torqueola</i>
Redstart:	Shearwater:
American, <i>Setophaga ruticilla</i>	Audubon's, <i>Puffinus lherminieri</i>
Painted, <i>Myioborus pictus</i>	Black-vented, <i>Puffinus opisthomelas</i>
Slaty-throated, <i>Myioborus miniatus</i>	Buller's, <i>Puffinus bulleri</i>
Reed-Bunting:	Christmas, <i>Puffinus nativitatus</i>
Common, <i>Emberiza schoeniculus</i>	Cory's, <i>Calonectris diomedea</i>
Pallas', <i>Emberiza pallasii</i>	Flesh-footed, <i>Puffinus carneipes</i>
Roadrunner, Greater, <i>Geococcyx californianus</i>	Greater, <i>Puffinus gravis</i>
Robin:	Little, <i>Puffinus assimilis</i>
American, <i>Turdus migratorius</i>	Manx, <i>Puffinus puffinus</i>
Clay-colored, <i>Turdus grayi</i>	Pink-footed, <i>Puffinus creatopus</i>
Rufous-backed, <i>Turdus rufopalliatus</i>	Short-tailed, <i>Puffinus tenuirostris</i>
Rosefinch, Common, <i>Carpodacus erythrinus</i>	Sooty, <i>Puffinus griseus</i>
Rough-winged Swallow, Northern, <i>Stelgidopteryx serripennis</i>	Townsend's, <i>Puffinus auricularis</i>
Rubythroat, Siberian, <i>Luscinia calliope</i>	Wedge-tailed, <i>Puffinus pacificus</i>
Ruff, <i>Philomachus pugnax</i>	Shoveler (see DUCKS)
Sanderling, <i>Calidris alba</i>	Shrike:
Sandpiper:	Loggerhead, <i>Lanius ludovicianus</i>
Baird's, <i>Calidris bairdii</i>	Northern, <i>Lanius excubitor</i>
Broad-billed, <i>Limicola falcinellus</i>	Siskin, Pine, <i>Carduelis pinus</i>
Buff-breasted, <i>Tryngites subruficollis</i>	Skimmer, Black, <i>Rhynchops niger</i>
Common, <i>Actitis hypoleucos</i>	Skua:
Curlew, <i>Calidris ferruginea</i>	Great, <i>Catharacta skua</i>
Least, <i>Calidris minutilla</i>	South Polar, <i>Catharacta maccormicki</i>
Marsh, <i>Tringa stagnatilis</i>	Skylark, Eurasian, <i>Alauda arvensis</i>
Pectoral, <i>Calidris melanotos</i>	Smew (see DUCKS)
Purple, <i>Calidris maritima</i>	Snipe:
Rock, <i>Calidris ptilocnemis</i>	Common, <i>Gallinago gallinago</i>
Semipalmated, <i>Calidris pusilla</i>	Jack, <i>Lymnocyptes minimus</i>
Sharp-tailed, <i>Calidris acuminata</i>	Pin-tailed, <i>Gallinago stenura</i>
Solitary, <i>Tringa solitaria</i>	Swinhoe's, <i>Gallinago megala</i>
Spoonbill, <i>Eurynorhynchus pygmeus</i>	Solitaire, Townsend's, <i>Myadestes townsendi</i>
Spotted, <i>Actitis macularia</i>	Sora, Porzana carolina
Stilt, <i>Calidris himantopus</i>	Sparrow:
Terek, <i>Xenus cinereus</i>	American Tree, <i>Spizella arborea</i>
Upland, <i>Bartramia longicauda</i>	Bachman's, <i>Aimophila aestivalis</i>
Western, <i>Calidris mauri</i>	Baird's, <i>Ammodramus bairdii</i>
White-rumped, <i>Calidris fuscicollis</i>	Black-chinned, <i>Spizella atrogularis</i>
Wood, <i>Tringa glareola</i>	Black-throated, <i>Amphispiza bilineata</i>
Sapsucker:	Botteri's, <i>Aimophila botterii</i>
Red-breasted, <i>Sphyrapicus ruber</i>	Brewer's, <i>Spizella breweri</i>
Williamson's, <i>Sphyrapicus thyroideus</i>	Cassin's, <i>Aimophila cassinii</i>
Yellow-bellied, <i>Sphyrapicus varius</i>	Chipping, <i>Spizella passerina</i>
Saw-whet Owl, Northern, <i>Aegolius acadicus</i>	Clay-colored, <i>Spizella pallida</i>
Scaup (see DUCKS)	Field, <i>Spizella pusilla</i>
Scoter (see DUCKS)	Five-striped, <i>Amphispiza quinquestrata</i>
Screech-Owl:	Fox, <i>Passerella iliaca</i>
Eastern, <i>Otus asio</i>	Golden-crowned, <i>Zonotrichia atricapilla</i>
	Grasshopper, <i>Ammodramus savannarum</i>

- Harris', *Zonotrichia querula*
Henslow's, *Ammodramus henslowii*
Lark, *Chondestes grammacus*
Le Conte's, *Ammodramus leconteii*
Lincoln's, *Melospiza lincolni*
Olive, *Arremonops rufivirgatus*
Rufous-crowned, *Aimophila ruficeps*
Rufous-winged, *Aimophila carpalis*
Sage, *Amphispiza belli*
Savannah, *Passerculus sandwichensis*
Seaside, *Ammodramus maritimus*
Sharp-tailed, *Ammodramus caudacutus*
Song, *Melospiza melodia*
Swamp, *Melospiza georgiana*
Vesper, *Poocetes gramineus*
White-crowned, *Zonotrichia leucophrys*
White-throated, *Zonotrichia albicollis*
Worthen's, *Spizella wortheni*
- Spoonbill, *Roseate, Ajaia ajaja*
- Starling:
Ashy, *Sturnus cineraceus*
Violet-backed, *Sturnus philippensis*
- Starthroat, *Plain-capped Heliomaster constantii*,
- Stilt, *Black-necked, Himantopus mexicanus*
- Stint:
Little, *Calidris minuta*
Long-toed, *Calidris subminuta*
Rufous-necked, *Calidris ruficollis*
Temminck's, *Calidris temminckii*
- Stork, *Wood, Mycteria americana*
- Storm-Petrel:
Ashy, *Oceanodroma homochroa*
Band-rumped, *Oceanodroma castro*
Black, *Oceanodroma melania*
Fork-tailed, *Oceanodroma furcata*
Leach's, *Oceanodroma leucorhoa*
Least, *Oceanodroma microsoma*
Sooty, *Oceanodroma tristrami*
Wedge-rumped, *Oceanodroma tethys*
White-faced, *Pelagadroma marina*
Wilson's, *Oceanites oceanicus*
- Surfbird, *Aphriza virgata*
- Swallow:
Bahama, *Tachycineta cyaneoviridis*
Bank, *Riparia riparia*
Barn, *Hirundo rustica*
Cave, *Hirundo fulva*
Cliff, *Hirundo pyrrhonota*
Rough-winged (see Rough-winged Swallow)
Tree, *Tachycineta bicolor*
Violet-green, *Tachycineta thalassina*
- Swan:
Trumpeter, *Cygnus buccinator*
Tundra, *Cygnus columbianus*
- Whooper, *Cygnus cygnus*
- Swift:
Antillean Palm, *Tachornis pheonicobia*
Black, *Cypseloides niger*
Chimney, *Chaetura pelagica*
Common, *Apus apus*
Fork-tailed, *Apus pacificus*
Needle-tailed (see Needletail)
Vaux's, *Chaetura vauxi*
White-collared, *Streptoprocne zonaris*
White-throated, *Aeronautes saxatalis*
- Tanager:
Heptatic, *Piranga flava*
Puerto Rican, *Neospingus speculariferus*
Scarlet, *Piranga olivacea*
Stripe-headed, *Spindalis zena*
Summer, *Piranga rubra*
Western, *Piranga ludoviciana*
- Tattler:
Gray-tailed, *Heteroscelus brevipes*
Wandering, *Heteroscelus incanus*
- Teal (see DUCKS)
- Tern:
Aleutian, *Sterna aleutica*
Arctic, *Sterna paradisaea*
Black, *Chlidonias niger*
Black-naped, *Sterna sumatrana*
Bridled, *Sterna anaethetus*
Caspian, *Sterna caspia*
Common, *Sterna hirundo*
Elegant, *Sterna elegans*
Forster's, *Sterna forsteri*
Gray-backed, *Sterna lunata*
Gull-billed, *Sterna nilotica*
Least, *Sterna antillarum*
Little, *Sterna albifrons*
Roseate, *Sterna dougallii*
Royal, *Sterna maxima*
Sandwich, *Sterna sandvicensis*
Sooty, *Sterna fuscata*
White, *Gygis alba*
White-winged, *Chlidonias leucopterus*
- Thrasher:
Bendire's, *Toxostoma bendirei*
Brown, *Toxostoma rufum*
California, *Toxostoma redivivum*
Crissal, *Toxostoma crissale*
Curve-billed, *Toxostoma curvirostre*
Le Conte's, *Toxostoma lecontei*
Long-billed, *Toxostoma longirostre*
Pearly-eyed, *Margarops fuscatus*
Sage, *Oreoscoptes montanus*
- Thrush:
Aztec, *Ridgwayia pinicola*

Blue Rock, *Monticola solitarius*
 Dusky, *Turdus naumanni*
 Eye-browed, *Turdus obscurus*
 Gray-cheeked, *Catharus minimus*
 Hawaiian, *Phaeornis obscurus*
 Hermit, *Catharus guttatus*
 Red-legged, *Turdus plumbeus*
 Small Kauai, *Phaeornis palmeri*
 Swainson's, *Catharus ustulatus*
 Varied, *Ixoreus naevius*
 Wood, *Hylocichla minima*
 Tit, Siberian, *Parus cinctus*
 Titmouse:
 Bridled, *Parus wollweberi*
 Plain, *Parus inornatus*
 Tufted, *Parus bicolor*
 Towhee:
 Abert's, *Pipilo aberti*
 Brown, *Pipilo fuscus*
 Green-tailed, *Pipilo chlorurus*
 Rufous-sided, *Pipilo erythrophthalmus*
 Tree-Pipit, Olive, *Anthus hodgsoni*
 Trogon:
 Eared, *Euptilotus neoxenus*
 Elegant, *Trogon elegans*
 Tropicbird:
 Red-billed, *Phaethon aethereus*
 Red-tailed, *Phaethon rubricauda*
 White-tailed, *Phaethon lepturus*
 Turnstone:
 Black, *Arenaria melanocephala*
 Ruddy, *Arenaria interpres*
 Veery, *Catharus fuscescens*
 Verdin, *Auriparus flaviceps*
 Violet-Ear, Green, *Colibri thalassinus*
 Vireo:
 Bell's, *Vireo bellii*
 Black-capped, *Vireo atricapillus*
 Black-whiskered, *Vireo altiloquus*
 Gray, *Vireo vicinior*
 Hutton's, *Vireo huttoni*
 Philadelphia, *Vireo philadelphicus*
 Puerto Rican, *Vireo latimeri*
 Red-eyed, *Vireo olivaceus*
 Solitary, *Vireo solitarius*
 Warbling, *Vireo gilvus*
 White-eyed, *Vireo griseus*
 Yellow-throated, *Vireo flavifrons*
 Vulture:
 Black, *Coragyps atratus*
 Turkey, *Cathartes aura*
 Wagtail:
 Black-backed, *Motacilla lugens*
 Gray, *Motacilla cinerea*

White, *Motacilla alba*
 Yellow, *Motacilla flava*
 Warbler:
 Adelaide's, *Dendroica adelaidae*
 Arctic, *Phylloscopus borealis*
 Bachman's, *Vermivora bachmanii*
 Bay-breasted, *Dendroica castanea*
 Black-and-white, *Mniotilta varia*
 Black-throated Blue, *Dendroica caerulescens*
 Black-throated Gray, *Dendroica nigrescens*
 Black-throated Green, *Dendroica virens*
 Blackburnian, *Dendroica fusca*
 Blackpoll, *Dendroica striata*
 Blue-winged, *Vermivora pinus*
 Canada, *Wilsonia canadensis*
 Cape May, *Dendroica tigrina*
 Cerulean, *Dendroica cerulea*
 Chestnut-sided, *Dendroica pensylvanica*
 Colima, *Vermivora crissalis*
 Connecticut, *Oporornis agilis*
 Elfin Woods, *Dendroica angelae*
 Golden-cheeked, *Dendroica chrysoparia*
 Golden-crowned, *Basileuterus culicivorus*
 Golden-winged, *Vermivora chrysoptera*
 Grace's, *Dendroica graciae*
 Grasshopper (see Grasshopper-Warbler)
 Hermit, *Dendroica occidentalis*
 Hooded, *Wilsonia citrina*
 Kentucky, *Oporornis formosus*
 Kirtland's, *Dendroica kirtlandii*
 Lucy's, *Vermivora luciae*
 MacGillivray's, *Oporornis tolmiei*
 Magnolia, *Dendroica magnolia*
 Mourning, *Oporornis philadelphia*
 Nashville, *Vermivora ruficapilla*
 Olive, *Peucedramus taeniatus*
 Orange-crowned, *Vermivora celata*
 Palm, *Dendroica palmarum*
 Parula (see Parula)
 Pine, *Dendroica pinus*
 Prairie, *Dendroica discolor*
 Prothonotary, *Protonotaria citrea*
 Red-faced, *Cardellina rubrifrons*
 Rufous-capped, *Basileuterus rufifrons*
 Swainson's, *Limothlypis swainsonii*
 Tennessee, *Vermivora peregrina*
 Townsend's, *Dendroica townsendi*
 Virginia's, *Vermivora virginiae*
 Willow, *Phylloscopus trochilus*
 Wilson's, *Wilsonia pusilla*
 Worm-eating, *Helmitheros vermivorus*
 Yellow, *Dendroica petechia*
 Yellow-rumped, *Dendroica coronata*
 Yellow-throated, *Dendroica dominica*

Waterthrush:
 Louisiana, *Seiurus motacilla*
 Northern, *Seiurus noveboracensis*

Waxwing:
 Bohemian, *Bombycilla garrulus*
 Cedar, *Bombycilla cedrorum*

Wheatear, Northern, *Oenanthe oenanthe*

Whimbrel, *Numenius phaeopus*

Whip-poor-will, *Caprimulgus vociferus*

Whistling-Duck (see DUCKS)

Wigeon (see DUCKS)

Willet, *Catoptrophorus semipalmatus*

Wood-Pewee:
 Eastern, *Contopus virens*
 Western, *Contopus sordidulus*

Woodcock:
 American, *Scolopax minor*
 Eurasian, *Scolopax rusticola*

Woodpecker:
 Acorn, *Melanerpes formicivorus*
 Black-backed, *Picoides arcticus*
 Downy, *Picoides pubescens*
 Gila, *Melanerpes uropygialis*
 Golden-fronted, *Melanerpes aurifrons*
 Hairy, *Picoides villosus*
 Ivory-billed, *Campyphilus principalis*
 Ladder-backed, *Picoides scalaris*
 Lewis', *Melanerpes lewis*
 Nuttall's, *Picoides nuttallii*
 Pileated, *Dryocopus pileatus*
 Puerto Rican, *Melanerpes portoricensis*
 Red-bellied, *Melanerpes carolinus*
 Red-cockaded, *Picoides borealis*
 Red-headed, *Melanerpes erythrocephalus*
 Strickland's, *Picoides stricklandi*
 Three-toed, *Picoides tridactylus*
 White-headed, *Picoides albolarvatus*

Woodstar, Bahama, *Calliphlox evelynae*

Wren:
 Bewick's, *Thryomanes bewickii*
 Cactus, *Campylorhynchus brunneicapillus*
 Canyon, *Catherpes mexicanus*
 Carolina, *Thryothorus ludovicianus*
 House, *Troglodytes aedon*
 Marsh, *Cistothorus palustris*
 Rock, *Salpinctes obsoletus*
 Sedge, *Cistothorus platensis*
 Winter, *Troglodytes troglodytes*

Wryneck, Eurasian, *Jynx torquilla*

Yellowlegs:
 Greater, *Tringa melanoleuca*
 Lesser, *Tringa flavipes*

Yellowthroat:
 Common, *Geothlypis trichas*

Gray-crowned, *Geothlypis poliocephala*

II. Taxonomic Listing

Order GAVIIFORMES

Family GAVIIDAE

Gavia stellata, Red-throated Loon
Gavia arctica, Arctic Loon
Gavia immer, Common Loon
Gavia adamsii, Yellow-billed Loon

Order PODICIPEDIFORMES

Family PODICIPEDIDAE

Tachybaptus dominicus, Least Grebe
Podilymbus podiceps, Pied-billed Grebe
Podiceps auritus, Horned Grebe
Podiceps grisegena, Red-necked Grebe
Podiceps nigricollis, Eared Grebe
Aechmophorus occidentalis, Western Grebe

Order PROCELLARIIFORMES

Family DIOMEDEIDAE

Diomedea albatrus, Short-tailed Albatross
Diomedea nigripes, Black-footed Albatross
Diomedea immutabilis, Laysan Albatross
Diomedea chlororhynchus, Yellow-nosed Albatross

Family PROCELLARIIDAE

Fulmarus glacialis, Northern Fulmar
Pterodroma hasitata, Black-capped Petrel
Pterodroma phaeopygia, Dark-rumped Petrel
Pterodroma externa, White-necked Petrel
Pterodroma inexpectata, Mottled Petrel
Pterodroma ultima, Murphy's Petrel
Pterodroma neglecta, Kermadec Petrel
Pterodroma arminjoniana, Herald Petrel
Pterodroma cookii, Cook's Petrel
Pterodroma hypoleuca, Bonin Petrel
Bulweria bulwerii, Bulwer's Petrel
Calonectris diomedea, Cory's Shearwater
Puffinus creatopus, Pink-footed Shearwater
Puffinus carneipes, Flesh-footed Shearwater
Puffinus gravis, Greater Shearwater
Puffinus pacificus, Wedge-tailed Shearwater
Puffinus bulleri, Buller's Shearwater
Puffinus griseus, Sooty Shearwater
Puffinus tenuirostris, Short-tailed Shearwater

Puffinus nativitatis, Christmas Shearwater
Puffinus puffinus, Manx Shearwater
Puffinus opisthomelas, Black-vented Shearwater
Puffinus auricularis, Townsend's Shearwater
Puffinus assimilis, Little Shearwater
Puffinus lherminieri, Audubon's Shearwater

Family HYDROBATIDAE

Oceanites oceanicus, Wilson's Storm-Petrel
Pelagodroma marina, White-faced Storm-Petrel
Oceanodroma furcata, Fork-tailed Storm-Petrel
Oceanodroma leucorhoa, Leach's Storm-Petrel
Oceanodroma homochroa, Ashy Storm-Petrel
Oceanodroma castro, Band-rumped Storm-Petrel
Oceanodroma tethys, Wedge-rumped Storm-Petrel
Oceanodroma melania, Black Storm-Petrel
Oceanodroma tristrami, Sooty Storm-Petrel
Oceanodroma microsoma, Least Storm-Petrel

Order PELECANIFORMES

Family PHAETHONTIDAE

Phaethon lepturus, White-tailed Tropicbird
Phaethon aethereus, Red-billed Tropicbird
Phaethon rubricauda, Red-tailed Tropicbird

Family SULIDAE

Sula dactylatra, Masked Booby
Sula nebouxii, Blue-footed Booby
Sula leucogaster, Brown Booby
Sula sula, Red-footed Booby
Sula bassanus, Northern Gannet

Family PELECANIDAE

Pelecanus erythrorhynchos, American White Pelican
Pelecanus occidentalis, Brown Pelican

Family PHALACROCORACIDAE

Phalacrocorax carbo, Great Cormorant
Phalacrocorax auritus, Double-crested Cormorant
Phalacrocorax olivaceus, Olivaceous Cormorant
Phalacrocorax penicillatus, Brandt's Cormorant
Phalacrocorax pelagicus, Pelagic Cormorant

Phalacrocorax urile, Red-faced Cormorant

Family ANHINGIDAE

Anhinga anhinga, Anhinga

Family FREGATIDAE

Fregata magnificens, Magnificent Frigatebird
Fregata minor, Great Frigatebird
Fregata ariel, Lesser Frigatebird

Order CICONIIFORMES

Family ARDEIDAE

Botaurus lentiginosus, American Bittern
Ixobrychus exilis, Least Bittern
Ixobrychus sinensis, Chinese Bittern
Ixobrychus eurhythmus, Schrenk's Bittern
Ardea herodias, Great Blue Heron
Casmerodius albus, Great Egret
Egretta eulophotes, Chinese Egret
Egretta sacra, Pacific Reef Heron
Egretta intermedia, Plumed Egret
Egretta thula, Snowy Egret
Egretta caerulea, Little Blue Heron
Egretta tricolor, Tricolored Heron
Egretta rufescens, Reddish Egret
Bubulcus ibis, Cattle Egret
Butorides striatus, Green-backed Heron
Nycticorax nycticorax, Black-crowned Night-Heron
Nycticorax melanolophus, Malay Night-Heron
Nycticorax goisagi, Japanese Night-Heron
Nycticorax violaceus, Yellow-crowned Night-Heron

Family THRESKIORNITHIDAE

Eudocimus albus, White Ibis
Eudocimus ruber, Scarlet Ibis
Plegadis falcinellus, Glossy Ibis
Plegadis chihi, White-faced Ibis
Ajaia ajaja, Roseate Spoonbill

Family CICONIIDAE

Jabiru mycteria, Jabiru
Mycteria americana, Wood Stork

Order PHOENICOPTERIFORMES

Family PHOENICOPTERIDAE

Phoenicopterus ruber, Greater Flamingo

Order ANSERIFORMES

Family ANATIDAE

Dendrocygna bicolor, Fulvous Whistling-Duck
Dendrocygna autumnalis, Black-bellied Whistling-Duck
Dendrocygna arborea, West Indian Whistling-Duck
Cygnus columbianus, Tundra Swan
Cygnus cygnus, Whooper Swan
Cygnus buccinator, Trumpeter Swan
Anser fabalis, Bean Goose
Anser albifrons, Greater White-fronted Goose
Chen caerulescens, Snow Goose
Chen rossii, Ross' Goose
Chen canagica, Emperor Goose
Branta bernicla, Brant
Branta leucopsis, Barnacle Goose
Branta canadensis, Canada Goose
Nesochen sandvicensis, Hawaiian Goose
Aix sponsa, Wood Duck
Anas crecca, Green-winged Teal
Anas formosa, Baikal Teal
Anas falcata, Falcated Teal
Anas rubripes, American Black Duck
Anas fulvigula, Mottled Duck
Anas platyrhynchos, Mallard
Anas wyvilliana, Hawaiian Duck
Anas laysanensis, Laysan Duck
Anas bahamensis, White-cheeked Pintail
Anas acuta, Northern Pintail
Anas querquedula, Garganey
Anas discors, Blue-winged Teal
Anas cyanoptera, Cinnamon Teal
Anas clypeata, Northern Shoveler
Anas strepera, Gadwall
Anas penelope, Eurasian Wigeon
Anas americana, American Wigeon
Aythya ferina, Common Pochard
Aythya valisineria, Canvasback
Aythya americana, Redhead
Aythya baeri, Baer's Pochard
Aythya collaris, Ring-necked Duck
Aythya fuligula, Tufted Duck
Aythya marila, Greater Scaup
Aythya affinis, Lesser Scaup
Somateria mollissima, Common Eider
Somateria spectabilis, King Eider
Somateria fischeri, Spectacled Eider
Polysticta stelleri, Steller's Eider
Histrionicus histrionicus, Harlequin Duck
Clangula hyemalis, Oldsquaw
Melanitta nigra, Black Scoter
Melanitta perspicillata, Surf Scoter
Melanitta fusca, White-winged Scoter
Bucephala clangula, Common Goldeneye
Bucephala islandica, Barrow's Goldeneye
Bucephala albeola, Bufflehead

Mergellus albellus, Smew
Lophodytes cucullatus, Hooded Merganser
Mergus merganser, Common Merganser
Mergus serrator, Red-breasted Merganser
Oxyura jamaicensis, Ruddy Duck
Oxyura dominica, Masked Duck

Order FALCONIFORMES

Family CATHARTIDAE

Coragyps atratus, Black Vulture
Cathartes aura, Turkey Vulture
Gymnogyps californianus, California Condor

Family ACCIPITRIDAE

Pandion haliaetus, Osprey
Chondrohierax uncinatus, Hook-billed Kite
Elanoides forficatus, American Swallow-tailed Kite
Elanus caeruleus, Black-shouldered Kite
Rostrhamus sociabilis, Snail Kite
Ictinia mississippiensis, Mississippi Kite
Milvus migrans, Black Kite
Haliaeetus leucocephalus, Bald Eagle
Haliaeetus albicilla, White-tailed Eagle
Haliaeetus pelagicus, Steller's Sea-Eagle
Circus cyaneus, Northern Harrier
Accipiter gularis, Asiatic Sparrow Hawk
Accipiter striatus, Sharp-shinned Hawk
Accipiter cooperii, Cooper's Hawk
Accipiter gentilis, Northern Goshawk
Buteogallus anthracinus, Common Black-Hawk
Parabuteo unicinctus, Harris' Hawk
Buteo nitidus, Gray Hawk
Buteo lineatus, Red-shouldered Hawk
Buteo platypterus, Broad-winged Hawk
Buteo brachyurus, Short-tailed Hawk
Buteo swainsoni, Swainson's Hawk
Buteo albicaudatus, White-tailed Hawk
Buteo albonotatus, Zone-tailed Hawk
Buteo solitarius, Hawaiian Hawk
Buteo jamaicensis, Red-tailed Hawk
Buteo regalis, Ferruginous Hawk
Buteo lagopus, Rough-legged Hawk
Aquila chrysaetos, Golden Eagle

Family FALCONIDAE

Polyborus plancus, Crested Caracara
Falco tinnunculus, Eurasian Kestrel
Falco sparverius, American Kestrel
Falco columbarius, Merlin
Falco femoralis, Aplomado Falcon

Falco peregrinus, Peregrine Falcon
Falco rusticolus, Gyrfalcon
Falco mexicanus, Prairie Falcon

Order GRUIFORMES

Family RALLIDAE

Coturnicops noveboracensis, Yellow Rail
Laterallus jamaicensis, Black Rail
Crex crex, Corn Crake
Rallus longirostris, Clapper Rail
Rallus elegans, King Rail
Rallus limicola, Virginia Rail
Porzana carolina, Sora
Porzana flaviventer, Yellow-breasted Crake
Porphyryla martinica, Purple Gallinule
Gallinula chloropus, Common Moorhen
Fulica atra, Eurasian Coot
Fulica americana, American Coot
Fulica caribaea, Caribbean Coot

Family ARAMIDAE

Aramus guarana, Limpkin

Family GRUIDAE

Grus canadensis, Sandhill Crane
Grus grus, Common Crane
Grus americana, Whooping Crane

Order CHARADRIIFORMES

Family CHARADRIIDAE

Vanellus vanellus, Northern Lapwing
Pluvialis squatarola, Black-bellied Plover
Pluvialis dominica, Lesser Golden-Plover
Charadrius mongolus, Mongolian Plover
Charadrius leschenaultii, Great Sand Plover
Charadrius alexandrinus, Snowy Plover
Charadrius wilsonia, Wilson's Plover
Charadrius hiaticula, Common Ringed Plover
Charadrius semipalmatus, Semipalmated Plover
Charadrius melodus, Piping Plover
Charadrius dubius, Little Ringed Plover
Charadrius vociferus, Killdeer
Charadrius montanus, Mountain Plover
Charadrius morinellus, Eurasian Dotterel

Family HAEMATOPODIDAE

Haematopus palliatus, American Oystercatcher

Haematopus bachmani, Black Oystercatcher

Family RECURVIROSTRIDAE

Himantopus mexicanus, Black-necked Stilt
Recurvirostra americana, American Avocet

Family JACANIDAE

Jacana spinosa, Northern Jacana

Family SCOLOPACIDAE

Tringa nebularia, Common Greenshank
Tringa melanoleuca, Greater Yellowlegs
Tringa flavipes, Lesser Yellowlegs
Tringa stagnatilis, Marsh Sandpiper
Tringa erythropus, Spotted Redshank
Tringa glareola, Wood Sandpiper
Tringa solitaria, Solitary Sandpiper
Catoptrophorus semipalmatus, Willet
Heteroscelus incanus, Wandering Tattler
Heteroscelus brevipes, Gray-tailed Tattler
Actitis hypoleucos, Common Sandpiper
Actitis macularia, Spotted Sandpiper
Xenus cinereus, Terek Sandpiper
Bartramia longicauda, Upland Sandpiper
Numenius minutus, Least Curlew
Numenius borealis, Eskimo Curlew
Numenius phaeopus, Whimbrel
Numenius tahitiensis, Bristle-thighed Curlew
Numenius madagascariensis, Far Eastern Curlew
Numenius americanus, Long-billed Curlew
Limosa limosa, Black-tailed Godwit
Limosa haemastica, Hudsonian Godwit
Limosa lapponica, Bar-tailed Godwit
Limosa fedoa, Marbled Godwit
Arenaria interpres, Ruddy Turnstone
Arenaria melanocephala, Black Turnstone
Aphriza virgata, Surf-bird
Calidris tenuirostris, Great Knot
Calidris canutus, Red Knot
Calidris alba, Sanderling
Calidris pusilla, Semipalmated Sandpiper
Calidris mauri, Western Sandpiper
Calidris ruficollis, Rufous-necked Stint
Calidris minuta, Little Stint
Calidris temminckii, Temminck's Stint
Calidris subminuta, Long-toed Stint
Calidris minutilla, Least Sandpiper
Calidris fuscicollis, White-rumped Sandpiper
Calidris bairdii, Baird's Sandpiper
Calidris melanotos, Pectoral Sandpiper
Calidris acuminata, Sharp-tailed Sandpiper

Calidris maritima, Purple Sandpiper
Calidris ptilocnemis, Rock Sandpiper
Calidris alpina, Dunlin
Calidris ferruginea, Curlew Sandpiper
Calidris himantopus, Stilt Sandpiper
Eurynorhynchus pygmeus, Spoonbill Sandpiper
Limicola falcinellus, Broad-billed Sandpiper
Tryngites subruficollis, Buff-breasted Sandpiper
Philomachus pugnax, Ruff
Limnodromus griseus, Short-billed Dowitcher
Limnodromus scolopaceus, Long-billed Dowitcher
Lymnocyptes minimus, Jack Snipe
Gallinago gallinago, Common Snipe
Gallinago stenura, Pin-tailed Snipe
Gallinago megala, Swinhoe's Snipe
Scolopax rusticola, Eurasian Woodcock
Scolopax minor, American Woodcock
Phalaropus tricolor, Wilson's Phalarope
Phalaropus lobatus, Red-necked Phalarope
Phalaropus fulicaria, Red Phalarope

Family LARIDAE

Stercorarius pomarinus, Pomarine Jaeger
Stercorarius parasiticus, Parasitic Jaeger
Stercorarius longicaudus, Long-tailed Jaeger
Catharacta skua, Great Skua
Catharacta maccormicki, South Polar Skua
Larus atricilla, Laughing Gull
Larus pipixcan, Franklin's Gull
Larus minutus, Little Gull
Larus ridibundus, Common Black-headed Gull
Larus philadelphia, Bonaparte's Gull
Larus heermanni, Heermann's Gull
Larus canus, Mew Gull
Larus delawarensis, Ring-billed Gull
Larus californicus, California Gull
Larus argentatus, Herring Gull
Larus thayeri, Thayer's Gull
Larus glaucoides, Iceland Gull
Larus fuscus, Lesser Black-backed Gull
Larus schistisagus, Slaty-backed Gull
Larus livens, Yellow-footed Gull
Larus occidentalis, Western Gull
Larus glaucescens, Glaucous-winged Gull
Larus hyperboreus, Glaucous Gull
Larus marinus, Great Black-backed Gull
Rissa tridactyla, Black-legged Kittiwake
Rissa brevirostris, Red-legged Kittiwake
Rhodostethia rosea, Ross' Gull
Xema sabini, Sabine's Gull
Pagophila eburnea, Ivory Gull
Sterna nilotica, Gull-billed Tern
Sterna caspia, Caspian Tern

Sterna maxima, Royal Tern
Sterna elegans, Elegant Tern
Sterna sandvicensis, Sandwich Tern
Sterna dougallii, Roseate Tern
Sterna hirundo, Common Tern
Sterna paradisaea, Arctic Tern
Sterna aleutica, Aleutian Tern
Sterna forsteri, Forster's Tern
Sterna antillarum, Least Tern
Sterna albifrons, Little Tern
Sterna sumatrana, Black-naped Tern
Sterna lunata, Gray-backed Tern
Sterna anaethetus, Bridled Tern
Sterna fuscata, Sooty Tern
Chlidonias leucopterus, White-winged Tern
Chlidonias niger, Black Tern
Anous stolidus, Brown Noddy
Anous minutus, Black Noddy
Anous tenuirostris, Lesser Noddy
Procelsterna cerulea, Blue-Gray Noddy
Gygis alba, White Tern
Rynchops niger, Black Skimmer

Family ALCIDAE

Alle alle, Dovekie
Uria aalge, Common Murre
Uria lomvia, Thick-billed Murre
Alca torda, Razorbill
Cepphus grylle, Black Guillemot
Cepphus columba, Pigeon Guillemot
Brachyramphus marmoratus, Marbled Murrelet
Brachyramphus brevirostris, Kittlitz's Murrelet
Synthliboramphus hypoleucus, Xantus' Murrelet
Synthliboramphus craveri, Craver's Murrelet
Synthliboramphus antiquus, Ancient Murrelet
Ptychoramphus aleuticus, Cassin's Auklet
Cyclorhynchus psittacula, Parakeet Auklet
Aethia pusilla, Least Auklet
Aethia pygmaea, Whiskered Auklet
Aethia cristatella, Crested Auklet
Cerorhinca monocerata, Rhinoceros Auklet
Fratercula cirrhata, Tufted Puffin
Fratercula arctica, Atlantic Puffin
Fratercula corniculata, Horned Puffin

Order COLUMBIFORMES

Family COLUMBIDAE

Columba squamosa, Scaly-naped Pigeon
Columba leucocephala, White-crowned Pigeon
Columba flavirostris, Red-billed Pigeon
Columba inornata, Plain Pigeon

Columba fasciata, Band-tailed Pigeon
Zenaida asiatica, White-winged Dove
Zenaida aurita, Zenaida Dove
Zenaida macroura, Mourning Dove
Columbina inca, Inca Dove
Columbina passerina, Common Ground-Dove
Columbina talpacoti, Ruddy Ground-Dove
Leptotila verreauxi, White-tipped Dove
Geotrygon chrysis, Key West Quail-Dove
Geotrygon mystacea, Bridled Quail-Dove
Geotrygon montana, Ruddy Quail-Dove

Order CUCULIFORMES

Family CUCULIDAE

Cuculus canorus, Common Cuckoo
Cuculus saturatus, Oriental Cuckoo
Cuculus fugax, Hodgson's Hawk-Cuckoo
Coccyzus erythrophthalmus, Black-billed Cuckoo
Coccyzus americanus, Yellow-billed Cuckoo
Coccyzus minor, Mangrove Cuckoo
Geococcyx californianus, Greater Roadrunner
Saurothera vieilloti, Puerto Rican Lizard-Cuckoo
Crotophaga ani, Smooth-billed Ani
Crotophaga sulcirostris, Groove-billed Ani

Order STRIGIFORMES

Family TYTONIDAE

Tyto alba, Common Barn-Owl

Family STRIGIDAE

Otus flammeolus, Flammulated Owl
Otus asio, Eastern Screech-Owl
Otus kernicottii, Western Screech-Owl
Otus trichopsis, Whiskered Screech-Owl
Otus nudipes, Puerto Rican Screech-Owl
Bubo virginianus, Great Horned Owl
Nyctea scandiaca, Snowy Owl
Surnia ulula, Northern Hawk-Owl
Glaucidium gnoma, Northern Pygmy-Owl
Glaucidium brasilianum, Ferruginous Pygmy-Owl
Micrathene whitneyi, Elf Owl
Athene cunicularia, Burrowing Owl
Strix occidentalis, Spotted Owl
Strix varia, Barred Owl
Strix nebulosa, Great Gray Owl
Asio otus, Long-eared Owl
Asio flammeus, Short-eared Owl
Aegolius funereus, Boreal Owl
Aegolius acadicus, Northern Saw-whet Owl

Order CAPRIMULGIFORMES

Family CAPRIMULGIDAE

Chordeiles acutipennis, Lesser Nighthawk
Chordeiles minor, Common Nighthawk
Chordeiles gundlachi, Antillean Nighthawk
Nyctidromus albicollis, Common Pauraque
Phalaenoptilus nuttallii, Common Poorwill
Caprimulgus carolinensis, Chuck-will's-widow
Caprimulgus ridgwayi, Buff-collared Nightjar
Caprimulgus vociferus, Whip-poor-will
Caprimulgus noctitherus, Puerto Rican Nightjar
Caprimulgus indicus, Jungle Nightjar

Order APODIFORMES

Family APODIDAE

Cypseloides niger, Black Swift
Streptoprocne zonaris, White-collared Swift
Chaetura pelagica, Chimney Swift
Chaetura vauxi, Vaux's Swift
Hirundapus caudacutus, White-throated Needletail
Apus apus, Common Swift
Apus pacificus, Fork-tailed Swift
Aeronautes saxatalis, White-throated Swift
Tachornis phoenicobia, Antillean Palm Swift

Family TROCHILIDAE

Colibri thalassinus, Green Violet-ear
Anthracothorax dominicus, Antillean Mango
Anthracothorax viridis, Green Mango
Eulampis holosericeus, Green-throated Carib
Orthorhynchus cristatus, Antillean Crested
 Hummingbird
Chlorostilbon maugaeus, Puerto Rican Emerald
Cynanthus latirostris, Broad-billed Hummingbird
Hylocharis leucotis, White-eared Hummingbird
Amazilia beryllina, Berylline Hummingbird
Amazilia yucatanensis, Buff-bellied Hummingbird
Amazilia violiceps, Violet-crowned Hummingbird
Lampornis clemenciae, Blue-throated Hummingbird
Eugenes fulgens, Magnificent Hummingbird
Heliomaster constantii, Plain-capped Starthroat
Calliphlox evelynae, Bahama Woodstar
Calothorax lucifer, Lucifer Hummingbird
Archilochus colubris, Ruby-throated Hummingbird
Archilochus alexandri, Black-chinned Hummingbird
Calypte anna, Anna's Hummingbird
Calypte costae, Costa's Hummingbird
Stellula calliope, Calliope Hummingbird
Selasphorus platycercus, Broad-tailed Hummingbird

Selasphorus rufus, Rufous Hummingbird
Selasphorus sasin, Allen's Hummingbird

Order TROGONIFORMES

Family TROGONIDAE

Trogon elegans, Elegant Trogon
Euptilotus neoxenus, Eared Trogon

Order CORACIIFORMES

Family UPUPIDAE

Upupa epops, Hoopoe

Family ALCEDINIDAE

Ceryle torquata, Ringed Kingfisher
Ceryle alcyon, Belted Kingfisher
Chloroceryle americana, Green Kingfisher

Order PICIFORMES

Family PICIDAE

Jynx torquilla, Eurasian Wryneck
Melanerpes lewis, Lewis' Woodpecker
Melanerpes erythrocephalus, Red-headed Woodpecker
Melanerpes formicivorus, Acorn Woodpecker
Melanerpes uropygialis, Gila Woodpecker
Melanerpes aurifrons, Golden-fronted Woodpecker
Melanerpes carolinus, Red-bellied Woodpecker
Melanerpes portoricensis, Puerto Rican Woodpecker
Sphyrapicus varius, Yellow-bellied Sapsucker
Sphyrapicus ruber, Red-breasted Sapsucker
Sphyrapicus thyroideus, Williamson's Sapsucker
Picoides scalaris, Ladder-Backed Woodpecker
Picoides nuttallii, Nuttall's Woodpecker
Picoides pubescens, Downy Woodpecker
Picoides villosus, Hairy Woodpecker
Picoides stricklandi, Strickland's Woodpecker
Picoides borealis, Red-cockaded Woodpecker
Picoides albolarvatus, White-headed Woodpecker
Picoides tridactylus, Three-toed Woodpecker
Picoides arcticus, Black-backed Woodpecker
Colaptes auratus, Northern Flicker
Dryocopus pileatus, Pileated Woodpecker
Campephilus principalis, Ivory-billed Woodpecker

Order PASSERIFORMES

Family TYRANNIDAE

Elaenia martinica, Caribbean Elaenia
Camptostoma imberbe, Northern Beardless-Tyrannulet
Contopus borealis, Olive-sided Flycatcher
Contopus pertinax, Greater Pewee
Contopus sordidulus, Western Wood-Pewee
Contopus virens, Eastern Wood-Pewee
Contopus latirostris, Lesser Antillean Pewee
Empidonax flaviventris, Yellow-bellied Flycatcher
Empidonax virescens, Acadian Flycatcher
Empidonax alnorum, Alder Flycatcher
Empidonax traillii, Willow Flycatcher
Empidonax minimus, Least Flycatcher
Empidonax hammondi, Hammond's Flycatcher
Empidonax oberholseri, Dusky Flycatcher
Empidonax wrightii, Gray Flycatcher
Empidonax difficilis, Western Flycatcher
Empidonax fulvifrons, Buff-breasted Flycatcher
Sayornis nigricans, Black Phoebe
Sayornis phoebe, Eastern Phoebe
Sayornis saya, Say's Phoebe
Pyrocephalus rubinus, Vermilion Flycatcher
Myiarchus tuberculifer, Dusky-capped Flycatcher
Myiarchus cinerascens, Ash-throated Flycatcher
Myiarchus nuttingi, Nutting's Flycatcher
Myiarchus crinitus, Great Crested Flycatcher
Myiarchus tyrannulus, Brown-crested Flycatcher
Myiarchus antillarum, Puerto Rican Flycatcher
Pitangus sulphuratus, Great Kiskadee
Myiodynastes luteiventris, Sulpher-bellied Flycatcher
Tyrannus melancholicus, Tropical Kingbird
Tyrannus couchii, Couch's Kingbird
Tyrannus vociferans, Cassin's Kingbird
Tyrannus crassirostris, Thick-billed Kingbird
Tyrannus verticalis, Western Kingbird
Tyrannus tyrannus, Eastern Kingbird
Tyrannus dominicensis, Gray Kingbird
Tyrannus caudifasciatus, Loggerhead Kingbird
Tyrannus forficatus, Scissor-tailed Flycatcher
Tyrannus savana, Fork-tailed Flycatcher
Pachyrhamphus aglaiae, Rose-throated Becard

Family ALAUDIDAE

Alauda arvensis, Eurasian Skylark
Eremophila alpestris, Horned Lark

Family HIRUNDINIDAE

Progne subis, Purple Martin
Progne cryptoleuca, Cuban Martin
Progne dominicensis, Caribbean Martin
Progne chalybea, Gray-breasted Martin
Tachycineta bicolor, Tree Swallow
Tachycineta thalassina, Violet-green Swallow

Tachycineta cyaneoviridis, Bahama Swallow	Sitta canadensis, Red-breasted Nuthatch
Stelgidopteryx serripennis, Northern Rough-winged Swallow	Sitta carolinensis, White-breasted Nuthatch
Riparia riparia, Bank Swallow	Sitta pygmaea, Pygmy Nuthatch
Hirundo pyrrhonota, Cliff Swallow	Sitta pusilla, Brown-headed Nuthatch
Hirundo fulva, Cave Swallow	
Hirundo rustica, Barn Swallow	Family CERTHIIDAE
Delichon urbica, Common House-Martin	Certhia americana, Brown Creeper
Family CORVIDAE	Family TROGLODYTIDAE
Perisoreus canadensis, Gray Jay	Campylorhynchus brunneicapillus, Cactus Wren
Cyanocitta stelleri, Steller's Jay	Salpinctes obsoletus, Rock Wren
Cyanocitta cristata, Blue Jay	Catherpes mexicanus, Canyon Wren
Cyanocorax yncas, Green Jay	Thryothorus ludovicianus, Carolina Wren
Cyanocorax morio, Brown Jay	Thryomanes bewickii, Bewick's Wren
Aphelocoma coerulescens, Scrub Jay	Troglodytes aedon, House Wren
Aphelocoma ultramarina, Gray-breasted Jay	Troglodytes troglodytes, Winter Wren
Gymnorhinus cyanocephalus, Pinyon Jay	Cistothorus platensis, Sedge Wren
Nucifraga columbiana, Clark's Nutcracker	Cistothorus palustris, Marsh Wren
Pica pica, Black-billed Magpie	
Pica nuttalli, Yellow-billed Magpie	Family CINCLIDAE
Corvus brachyrhynchos, American Crow	Cinclus mexicanus, American Dipper
Corvus caurinus, Northwestern Crow	
Corvus leucognaphalus, White-necked Crow	Family MUSCICAPIDAE
Corvus imparatus, Mexican Crow	Subfamily SYLVIINAE
Corvus ossifragus, Fish Crow	Locustella ochotensis, Middendorff's Grasshopper-Warbler
Corvus hawaiiensis, Hawaiian Crow	Phylloscopus borealis, Arctic Warbler
Corvus cryptoleucus, Chihuahuan Raven	Phylloscopus trochilus, Willow Warbler
Corvus corax, Common Raven	Regulus satrapa, Golden-crowned Kinglet
Family PARIDAE	Regulus calendula, Ruby-crowned Kinglet
Parus atricapillus, Black-capped Chickadee	Polioptila caerulea, Blue-gray Gnatcatcher
Parus carolinensis, Carolina Chickadee	Polioptila melanura, Black-tailed Gnatcatcher
Parus sclateri, Mexican Chickadee	Polioptila nigriceps, Black-capped Gnatcatcher
Parus gambeli, Mountain Chickadee	
Parus cinctus, Siberian Tit	Subfamily MUSCICAPINAE
Parus hudsonicus, Boreal Chickadee	Muscicapa griseisticta, Gray-spotted Flycatcher
Parus rufescens, Chestnut-backed Chickadee	Muscicapa narcissina, Narcissus Flycatcher
Parus wollweberi, Bridled Titmouse	
Parus inornatus, Plain Titmouse	Subfamily TURDINAE
Parus bicolor, Tufted Titmouse	Luscinia calliope, Siberian Rubythroat
Family REMIZIDAE	Luscinia svecica, Bluethroat
Auriparus flaviceps, Verdin	Monticola solitarius, Blue Rock Thrush
Family AEGITHALIDAE	Oenanthe oenanthe, Northern Wheatear
Psaltriparus minimus, Bushtit	Sialis sialis, Eastern Bluebird
Family SITTIDAE	Sialis mexicana, Western Bluebird
	Sialis currucoides, Mountain Bluebird
	Myadestes townsendi, Townsend's Solitaire

Phaeornis obscurus, Hawaiian Thrush
 Phaeornis palmeri, Small Kauai Thrush
 Catharus fuscescens, Veery
 Catharus minimus, Gray-cheeked Thrush
 Catharus ustulatus, Swainson's Thrush
 Catharus guttatus, Hermit Thrush
 Hylocichla mustelina, Wood Thrush
 Turdus plumbeus, Red-legged Thrush
 Turdus obscurus, Eye-browed Thrush
 Turdus naumanni, Dusky Thrush
 Turdus pilaris, Fieldfare
 Turdus grayi, Clay-colored Robin
 Turdus rufopalliatus, Rufous-backed Robin
 Turdus migratorius, American Robin
 Ixoreus naevius, Varied Thrush
 Ridgwayia pinicola, Aztec Thrush

Family MIMIDAE

Dumetella carolinensis, Gray Catbird
 Mimus polyglottos, Northern Mockingbird
 Oreoscoptes montanus, Sage Thrasher
 Toxostoma rufum, Brown Thrasher
 Toxostoma longirostre, Long-billed Thrasher
 Toxostoma bendirei, Bendire's Thrasher
 Toxostoma curvirostre, Curve-billed Thrasher
 Toxostoma redivivum, California Thrasher
 Toxostoma crissale, Crissal Thrasher
 Toxostoma lecontei, Le Conte's Thrasher
 Margarops fuscatus, Pearly-eyed Thrasher

Family PRUNELLIDAE

Prunella montanella, Siberian Accentor

Family MOTACILLIDAE

Motacilla flava, Yellow Wagtail
 Motacilla cinerea, Gray Wagtail
 Motacilla alba, White Wagtail
 Motacilla lugens, Black-backed Wagtail
 Anthus hodgsoni, Olive Tree-Pipit
 Anthus gustavi, Pechora Pipit
 Anthus cervinus, Red-throated Pipit
 Anthus spinoletta, Water Pipit
 Anthus spragueii, Sprague's Pipit

Family BOMBYCILLIDAE

Bombycilla garrulus, Bohemian Waxwing
 Bombycilla cedrorum, Cedar Waxwing

Family PTILOGONATIDAE

Phainopepla nitens, Phainopepla

Family LANIIDAE

Lanius excubitor, Northern Shrike
 Lanius ludovicianus, Loggerhead Shrike

Family STURNIDAE

Sturnus philippensis, Violet-backed Starling
 Sturnus cineraceus, Ashy Starling

Family VIREONIDAE

Vireo griseus, White-eyed Vireo
 Vireo latimeri, Puerto Rican Vireo
 Vireo bellii, Bells' Vireo
 Vireo atricapillus, Black-capped Vireo
 Vireo vicinior, Gray Vireo
 Vireo solitarius, Solitary Vireo
 Vireo flavifrons, Yellow-throated Vireo
 Vireo huttoni, Hutton's Vireo
 Vireo gilvus, Warbling Vireo
 Vireo philadelphicus, Philadelphia Vireo
 Vireo olivaceus, Red-eyed Vireo
 Vireo altiloquus, Black-whiskered Vireo

Family EMBERIZIDAE

Subfamily PARULINAE

Vermivora bachmanii, Bachman's Warbler
 Vermivora pinus, Blue-winged Warbler
 Vermivora chrysoptera, Golden-winged Warbler
 Vermivora peregrina, Tennessee Warbler
 Vermivora celata, Orange-crowned Warbler
 Vermivora ruficapilla, Nashville Warbler
 Vermivora virginiae, Virginia's Warbler
 Vermivora crissalis, Colima Warbler
 Vermivora luciae, Lucy's Warbler
 Parula americana, Northern Parula
 Parula pitayumi, Tropical Parula
 Dendroica petechia, Yellow Warbler
 Dendroica pensylvanica, Chestnut-sided Warbler
 Dendroica magnolia, Magnolia Warbler
 Dendroica tigrina, Cape May Warbler
 Dendroica caerulescens, Black-throated Blue Warbler
 Dendroica coronata, Yellow-rumped Warbler
 Dendroica nigrescens, Black-throated Gray Warbler
 Dendroica townsendi, Townsend's Warbler
 Dendroica occidentalis, Hermit Warbler
 Dendroica virens, Black-throated Green Warbler
 Dendroica chrysoparia, Golden-cheeked Warbler
 Dendroica fusca, Blackburnian Warbler

Dendroica dominica, Yellow-throated Warbler
Dendroica graciae, Grace's Warbler
Dendroica adelaidae, Adelaide's Warbler
Dendroica pinus, Pine Warbler
Dendroica kirtlandii, Kirtland's Warbler
Dendroica discolor, Prairie Warbler
Dendroica palmarum, Palm Warbler
Dendroica castanea, Bay-breasted Warbler
Dendroica striata, Blackpoll Warbler
Dendroica cerulea, Cerulean Warbler
Dendroica angelae, Elfin Woods Warbler
Mniotilta varia, Black-and-White Warbler
Setophaga ruticilla, American Redstart
Protonotaria citrea, Prothonotary Warbler
Helminthos vermivorus, Worm-eating Warbler
Limothlypis swainsonii, Swainson's Warbler
Seiurus aurocapillus, Ovenbird
Seiurus noveboracensis, Northern Waterthrush
Seiurus motacilla, Louisiana Waterthrush
Oporornis formosus, Kentucky Warbler
Oporornis agilis, Connecticut Warbler
Oporornis philadelphia, Mourning Warbler
Oporornis tolmiei, MacGillivray's Warbler
Geothlypis trichas, Common Yellowthroat
Geothlypis poliocephala, Gray-crowned Yellowthroat
Wilsonia citrina, Hooded Warbler
Wilsonia pusilla, Wilson's Warbler
Wilsonia canadensis, Canada Warbler
Cardellina rubrifrons, Red-faced Warbler
Myioborus pictus, Painted Redstart
Myioborus miniatus, Slaty-throated Redstart
Basileuterus culicivorus, Golden-crowned Warbler
Basileuterus rufifrons, Rufous-capped Warbler
Icteria virens, Yellow-breasted Chat
Peucedramus taeniatus, Olive Warbler

Subfamily THRAUPINAE

Spindalis zena, Stripe-headed Tanager
Neospingus speculiferus, Puerto Rican Tanager
Piranga flava, Hepatic Tanager
Piranga rubra, Summer Tanager
Piranga olivacea, Scarlet Tanager
Piranga ludoviciana, Western Tanager
Euphonia musica, Antillean Euphonia

Subfamily CARDINALINAE

Rhodothraupis celaeno, Crimson-collared Grosbeak
Cardinalis cardinalis, Northern Cardinal
Cardinalis sinuatus, Pyrrhuloxia
Pheucticus chrysopleus, Yellow Grosbeak
Pheucticus ludovicianus, Rose-breasted Grosbeak
Pheucticus melanocephalus, Black-headed Grosbeak

Guiraca caerulea, Blue Grosbeak
Passerina amoena, Lazuli Bunting
Passerina cyanea, Indigo Bunting
Passerina versicolor, Varied Bunting
Passerina ciris, Painted Bunting
Spiza americana, Dickcissel

Subfamily EMBERIZINAE

Arremonops rufivirgatus, Olive Sparrow
Pipilo chlorurus, Green-tailed Towhee
Pipilo erythrophthalmus, Rufous-sided Towhee
Pipilo fuscus, Brown Towhee
Pipilo aberti, Abert's Towhee
Sporophila torqueola, White-collared Seedeater
Tiaris olivacea, Yellow-faced Grassquit
Tiaris bicolor, Black-faced Grassquit
Loxigilla portoricensis, Puerto Rican Bullfinch
Aimophila aestivalis, Bachman's Sparrow
Aimophila botterii, Botteri's Sparrow
Aimophila cassinii, Cassin's Sparrow
Aimophila carpalis, Rufous-winged Sparrow
Aimophila ruficeps, Rufous-crowned Sparrow
Spizella arborea, American Tree Sparrow
Spizella passerina, Chipping Sparrow
Spizella pallida, Clay-colored Sparrow
Spizella breweri, Brewer's Sparrow
Spizella pusilla, Field Sparrow
Spizella wortheni, Worthen's Sparrow
Spizella atrogularis, Black-chinned Sparrow
Poocetes gramineus, Vesper Sparrow
Chondestes grammacus, Lark Sparrow
Amphispiza bilineata, Black-throated Sparrow
Amphispiza belli, Sage Sparrow
Amphispiza quinquestriata, Five-striped Sparrow
Calamospiza melanocorys, Lark Bunting
Passerculus sandwichensis, Savannah Sparrow
Ammodramus bairdii, Baird's Sparrow
Ammodramus savannarum, Grasshopper Sparrow
Ammodramus henslowii, Henslow's Sparrow
Ammodramus leconteii, Le Conte's Sparrow
Ammodramus caudacutus, Sharp-tailed Sparrow
Ammodramus maritimus, Seaside Sparrow
Passerella iliaca, Fox Sparrow
Melospiza melodia, Song Sparrow
Melospiza lincolni, Lincoln's Sparrow
Melospiza georgiana, Swamp Sparrow
Zonotrichia albicollis, White-throated Sparrow
Zonotrichia atricapilla, Golden-crowned Sparrow
Zonotrichia leucophrys, White-crowned Sparrow
Zonotrichia querula, Harris' Sparrow
Junco hyemalis, Dark-eyed Junco
Junco phaeonotus, Yellow-eyed Junco
Emberiza rustica, Rustic Bunting

Emberiza pallasi, Pallas' Reed-Bunting
Emberiza schoeniculus, Common Reed-Bunting
Calcarius mccownii, McCown's Longspur
Calcarius lapponicus, Lapland Longspur
Calcarius pictus, Smith's Longspur
Calcarius ornatus, Chestnut-collared Longspur
Plectrophenax nivalis, Snow Bunting
Plectrophenax hyperboreus, McKay's Bunting

Subfamily ICTERINAE

Dolichonyx oryzivorus, Bobolink
Agelaius phoeniceus, Red-winged Blackbird
Agelaius tricolor, Tricolored Blackbird
Agelaius humeralis, Tawny-shouldered Blackbird
Agelaius xanthomus, Yellow-shouldered Blackbird
Sturnella magna, Eastern Meadowlark
Sturnella neglecta, Western Meadowlark
Xanthocephalus xanthocephalus, Yellow-headed Blackbird
Euphagus carolinus, Rusty Blackbird
Euphagus cyanocephalus, Brewer's Blackbird
Quiscalus mexicanus, Great-tailed Grackle
Quiscalus major, Boat-tailed Grackle
Quiscalus quiscula, Common Grackle
Quiscalus niger, Greater Antillean Grackle
Molothrus bonariensis, Shiny Cowbird
Molothrus aeneus, Bronzed Cowbird
Molothrus ater, Brown-headed Cowbird
Icterus dominicensis, Black-cowled Oriole
Icterus wagleri, Black-vented Oriole
Icterus spurius, Orchard Oriole
Icterus cucullatus, Hooded Oriole
Icterus pustulatus, Streak-backed Oriole
Icterus gularis, Altamira Oriole
Icterus graduacauda, Audubon's Oriole
Icterus galbula, Northern Oriole
Icterus parisorum, Scott's Oriole

Family FRINGILLIDAE

Subfamily FRINGILLINAE

Fringilla montifringilla, Brambling

Subfamily CARDUELINAE

Leucosticte arctoa, Rosy Finch
Pinicola enucleator, Pine Grosbeak
Carpodacus erythrinus, Common Rosefinch

Carpodacus purpureus, Purple Finch
Carpodacus cassinii, Cassin's Finch
Carpodacus mexicanus, House Finch

Loxia curvirostra, Red Crossbill
Loxia leucoptera, White-winged Crossbill
Carduelis flammea, Common Redpoll
Carduelis hornemanni, Hoary Redpoll
Carduelis pinus, Pine Siskin
Carduelis psaltria, Lesser Goldfinch
Carduelis lawrencei, Lawrence's Goldfinch
Carduelis tristis, American Goldfinch
Carduelis sinica, Oriental Greenfinch
Pyrrhula pyrrhula, Eurasian Bullfinch
Coccothraustes vespertinus, Evening Grosbeak
Coccothraustes coccothraustes, Hawfinch

SOURCE: [50 FR 13710, Apr. 5, 1985]

SUBPART C -- ADDRESSES

§ 10.21 Director.

(a) Mail forwarded to the Director for law enforcement purposes should be addressed: Chief, Division of Law Enforcement, U.S. Fish and Wildlife Service, P.O. Box 3247, Arlington, VA 22203-3247.

(b) Mail forwarded to the Director with reference to permits should be addressed: Chief, Office of Management Authority, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Room 432, Arlington, VA 22203. SOURCE: [55 FR 48851, Nov. 23, 1990]

§ 10.22 Law enforcement offices.

Service law enforcement offices and their areas of responsibility follow. Mail should be addressed: "Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, (appropriate address below)":

Areas of Responsibility and Office Addresses

California, Hawaii, Idaho, Nevada, Oregon, Washington, American Samoa, Guam, the Marshall Islands, Northern Mariana Islands, and the Trust Territory of the Pacific Islands (District 1):

Eastside Federal Complex, 911 N.E. 11th Avenue, Portland, OR 97232-4181, Telephone: 503-231-6125.

Arizona, New Mexico, Oklahoma, and Texas (District 2):
 P.O. Box 329, Albuquerque, NM 87103, Telephone: 505-766-2091

Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin (District 3):

P.O. Box 45--Federal Building, Ft. Snelling, Twin Cities, MN 55111, Telephone: 612-725-3530.

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the Virgin Islands (District 4):

P.O. Box 4839, Atlanta, GA 30302, Telephone: 404-331-5872

Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia (District 5):

P.O. Box 129, New Town Branch, Boston, MA 02258, Telephone: 617-965-2298

Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming (District 6):

P.O. Box 25486, Denver Federal Center, Denver, CO 80225, Telephone: 303-236-7540

Alaska (District 7):

P.O. Box 92597, Anchorage, AK 99509-2597, Telephone: 907-786-3311

Any foreign country (Washington Office):

P.O. Box 3247, Arlington, VA 22203-3247, Telephone: 703-358-1949.

SOURCE: [48 FR 1313, Jan. 12, 1983; 48 FR 37040, Aug. 16, 1983, as amended at 49 FR 31291, Aug. 6, 1984; 51 FR 23551, June 30, 1986; 53 FR 6649, Mar. 2, 1988; 55 FR 48851, Nov. 23, 1990]

Corporate Process Requirement No: CPR400.1.1

Sponsor: Dori Ellis, 4000, Acting

Revision Date: August

20, 2004

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ES&H Manual

CHAPTER 15 – EMERGENCY PREPAREDNESS AND MANAGEMENT

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MN471001, Issue H

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Review Date: June 18, 2006

Administrative Changes: June 29, 2005, July 5, 2006, and [November 6, 2006](#)

* Indicates a substantive change

- [Applicability](#)
 - [Calling for Help](#)
 - [*Planning and Preparedness](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [15-1](#) - What to Do During an Emergency
 - [15-2](#) - Manager's Checklist
 - [*15-3](#) - SNL/NM Building Evacuation Team Responsibilities
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This chapter applies to all Members of the Workforce and [visitors](#) at [Sandia-controlled premises](#). Members of the Workforce working or visiting at sites other than at Sandia-controlled premises shall be aware of and follow the [emergency](#) procedures for the host site.

CALLING FOR HELP

Requirements

Members of the Workforce shall call the appropriate phone number in the table below (as soon as it is safe to do so) when:

- An [emergency](#) condition is observed or experienced.
- An unusual condition that does not appear to constitute an emergency, but are unsure whether an emergency exists.

Emergency Phone Numbers	
Location	Phone
SNL/NM (within KAFB)	911 or 844-0911 (cellular)
SNL/CA	911 or 294-2222 (cellular)
TTR	911
KTF	335-5611 or 0 (emergency) 9-335-4333 (fire) 9-335-4523 (bomb threat)

Other	Check with host site. Dialing 911 may not be appropriate.
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Members of the Workforce shall call the appropriate phone number in the table below when they observe or experience an unusual condition that does not appear to constitute an emergency.

<u>Non-Emergency</u> Phone Numbers	
Location	Phone
SNL/NM (within KAFB)	311 or 844-6515 or 844-0311 (cellular)
SNL/CA	294-3724
TTR	295-8285
KTF	335-5611 or 0
Other	Check with host site.

Guidance

Examples of an **emergency** include:

- Natural gas odor in a building.
- Large liquid spill on the ground or near a drain.
- Someone who is unconsciousness or having difficulty breathing.
- Situations exceeding capabilities of personnel and/or resources which could impact life safety, health, and the environment.

An example of a **non-emergency** is a tripping hazard.

*PLANNING AND PREPAREDNESS

Requirements

Managers shall be responsible for ensuring that:

- Applicable emergency management responsibilities and actions that are to be performed upon receiving notification of a change in a security condition (SECON) level are implemented.

Note: Responsibilities and actions are described in either the SNL/NM DOE Security Conditions (SECON) Implementation Plan, or in their own organization-specific SECON implementation plan, as applicable.

- The appropriate [emergency plan](#) is developed as follows:

- An [emergency action plan](#):

- Is written if all of the following conditions are true:

- An [emergency response plan](#) has **not** been written.
- The manager in any facility or building is responsible for ten (10) or more Members of the Workforce within the facility or building.

Note: If the manager is responsible for less than ten (10) Members of the Workforce, Attachment 15-1, "What to Do During an Emergency," may serve in lieu of an emergency action plan provided the manager:

- Orally communicates the plan to employees.
- Documents the communication.
- Ensures the elements of an emergency action plan are included in the briefing.

- Communicates, at a minimum, the following elements:

- Procedures for reporting a fire or other emergency.
- Procedures for emergency evacuation, including type of evacuation and exit route assignments.

- Procedures to be followed by Members of the Workforce who remain to operate critical plant operations before they evacuate.
- Procedures to account for all Members of the Workforce after evacuation, as appropriate.

Note: This is performed during the sweeps conducted by the Building Evacuation Teams as outlined in [Attachment 15-3](#), “SNL/NM Building Evacuation Team Responsibilities,” unless otherwise specified.

- Procedures to be followed by Members of the Workforce performing rescue or medical duties.
- The name or job title of every Member of the Workforce who may be contacted by personnel who need more information about the plan or an explanation of their duties under the plan.

Note: Additional critical information that should appear in the [emergency action](#) or [emergency response plan](#) can be found in [Attachment 15-3](#), “SNL/NM Building Evacuation Team Responsibilities.”

- An [emergency response plan](#):

- Is written if all of the following conditions are true:
 - The manager will evacuate Members of the Workforce from the danger area when an emergency occurs.
 - The manager permits any Member of the Workforce, in which the manager is responsible for, to assist in handling the emergency.
 - An emergency action plan, as outline above, has **not** been written.
- Communicates, at a minimum, the following elements:
 - Pre-emergency planning.
 - Roles for Members of the Workforce and lines of authority.

- Training requirements.
 - Lines of communication.
 - Emergency recognition and prevention.
 - Safe distances and [assembly areas](#).
 - Site security and control.
 - Evacuation routes and procedures.
 - Decontamination procedures that are not covered by the site safety and health plan.
 - Emergency medical treatment and first aid.
 - Emergency alerting and response procedures.
 - A plan for critique of response and follow-up.
 - Appropriate personal protective equipment (PPE) and emergency equipment.
- That is facility- or building-specific, is consistent with the appropriate SNL site emergency plan, and exists for the space in which their Members of the Workforce perform their daily activities.

- Is written, reviewed, and approved in accordance with [Chapter 21](#), “Technical Work Documents (TWDs),” and forwarded to the appropriate emergency management coordinator for final review.
- Identifies any training required, as applicable, to ensure that building evacuation team members receive the appropriate training (i.e., Sandia Protective Action Notification training at SNL/NM that is provided by Emergency Management).

Note: At SNL/CA, guidance for building evacuation activities can be found in [Procedure 210](#), *Emergency Plan Implementing Procedure*, and in building specific evacuation plans. Contact the SNL/CA building emergency team

leader or the SNL/CA site emergency management coordinator for more information.



- Emergency preparedness and management-relevant TWDs are:
 - Written and approved in accordance with [Chapter 21](#), "Technical Work Documents (TWDs)," as appropriate.
 - Updated when changes in processes/operations that increase or decrease the potential for unplanned releases of hazardous materials beyond the workplace occur, as appropriate.
- Changes in the following are reported to the Emergency Operations Center for all Sandia-controlled premises:



- Inventories of hazardous materials that exceed, or lessen those inventories that previously exceeded, applicable emergency planning threshold limits.

Note: The Primary Hazard Screening (PHS) Question Set 5 requests this information. Managers may use the information reported in the PHS to report this information to the Emergency Operations Center.

- Processes/operations that increase or decrease the potential for unplanned releases of hazardous materials beyond the workplace.
- The emergency action or emergency response plan is made available at the workplace for review by Members of the Workforce, with particular emphasis on those parts of the plan that individuals must know to protect themselves in the event of an emergency, at the following times:
 - Upon initial assignment of Members of the Workforce to a facility.
 - When the plan is initially developed.
 - Whenever the plan is changed or an individual's responsibilities or designated actions under the plan change.
- Any building or facility in which they are responsible for ten (10) or more Members of the Workforce has:
 - A [building evacuation team](#)



Note: See [Attachment 15-3](#), "SNL/NM Building Evacuation Team Responsibilities," for activities at SNL/NM. At SNL/CA, see Procedure 210, *Emergency Plan Implementing Procedure*.

- Building-specific evacuation team procedures and rosters.

Note: Members of the Workforce should follow these procedures for buildings with fewer than ten (10) occupants, as a good business practice. Buildings at KTF and TTR that have fewer than ten (10) occupants follow their site-specific evacuation and emergency procedures.

- Members of the Workforce are informed of:
 - Who to call in an [emergency](#).
 - The location of emergency exits and [assembly areas](#).
 - Emergency warning signals and conditions indicating an emergency.
- Actions needed to accommodate special needs of Members of the Workforce and visitors are identified, planned, and implemented during an emergency.
- Actions needed to preserve and document the scene of an accident are established (see [Section 2D](#), "Perform Work," under the topic "Unplanned Conditions or Events and Emergency Response").

SNL/NM building evacuation team members shall follow the requirements and guidance found in [Attachment 15-3](#), "SNL/NM Building Evacuation Team Responsibilities." SNL/CA building evacuation team members shall follow their specific emergency plan.

Members of the Workforce shall:

- Follow their facility-specific **emergency action or emergency response plan** and keep up to date on:
 - Who to call for help.
 - The location of emergency exits, areas of refuge, and assembly areas.

- Emergency warning signals and conditions indicating an emergency.
- Actions to take during an emergency (see [Attachment 15-1](#), "What to Do During an Emergency").
- Obey the instructions of [emergency response personnel](#) and fire protection.
- Assist the Emergency Operations Center, **as appropriate, when contacted by an Incident Commander or Emergency Planner in:**
 - **Updating and maintaining building profiles (consult the evacuation team contact or the Emergency Operations Center for additional information).**
 - **Planning and conducting emergency drill and exercise events that could impact organization personnel or facilities.**



Guidance

Managers should:

- Periodically review the manager's checklist in [Attachment 15-2](#), "Manager's Checklist," to ensure that they are prepared for emergencies.
- At SNL/NM, ensure building evacuation team rosters are updated and provided to [emergency management personnel](#) and [fire protection](#).
- Ensure a properly-sized evacuation team, briefed in safe and orderly evacuation procedures (consult [emergency management personnel](#) for assistance) is established.
- At SNL/NM, consult with [emergency management personnel](#) for assistance in determining the size of the building evacuation team. Team size is based on:
 - Number of building exits.
 - Number of residents.
 - Building hazards.
 - Engineering controls.

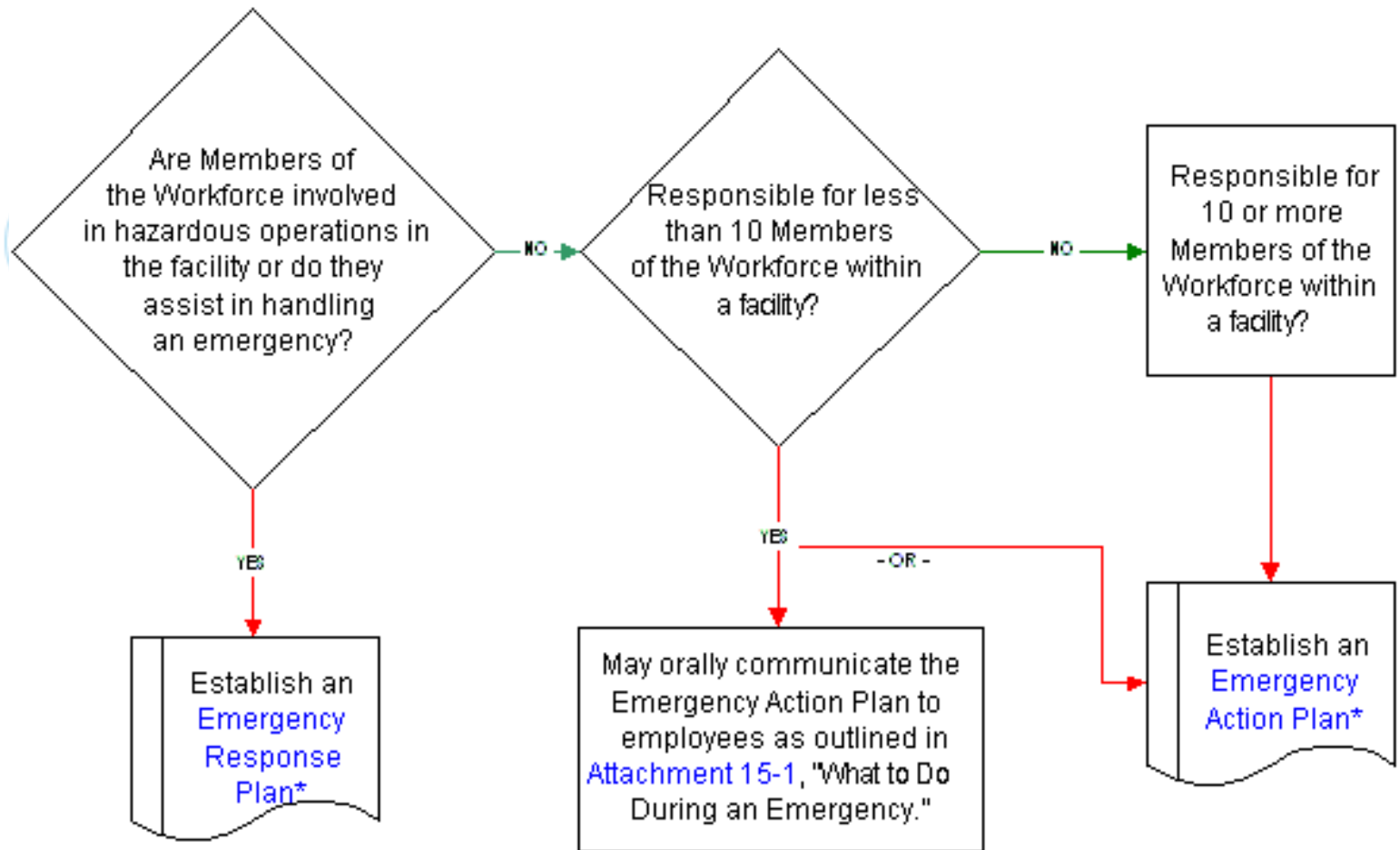




- o Available communication systems.

Note: A building evacuation team should include an evacuation team captain and enough members to effectively communicate and implement protective actions to ensure a prompt evacuation of the building.

Manager's Guide - Emergency Action Plan or Emergency Response Plan Decision Process



*When the appropriate plan has been established and written, contact the Emergency Management contact for review. Once reviewed, ensure Members of the Workforce and visitors are instructed in the actions to be taken in the event of an emergency, as appropriate.

Members of the Workforce should review the requirements in [Attachment 15-1](#), "What to Do During an Emergency," before an emergency arises to ensure a quick, calm, and appropriate response during an emergency.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [emergency](#) preparedness and [emergency management](#) include:

Hazard/Activity	Reference
Chemical spills	Section 10E , "Chemical Spills."
Emergency planning and procedures	PN471011 , <i>SNL/NM Emergency Plan</i> ; <i>SNL/CA Emergency Plan</i> .
Environmental protection	Chapter 10 , "Environmental Protection."
Fire protection	Chapter 5 , "Fire Protection."
Hazardous material (HAZMAT) teams	Section 6K , "Hazardous Waste Operations and Emergency Response (HAZWOPER)."
Medical emergencies	Chapter 16 , "Health, Benefits, and Employee Services."
Radiological incidents	CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual</i> , Chapter 11 , "Radiological Incidents."
Reporting, investigating, and correcting ES&H events	Chapter 18 , "Reporting, Investigating, and Correcting ES&H Events."
Risk management	Chapter 13 , "Hazards Identification/Analysis, and Risk Management."

REFERENCES

Requirements Source Documents

[29 CFR 1910.38](#), *Emergency Action Plans*.

[29 CFR 1910.119](#), *Process Safety Management of Highly Hazardous Chemicals*.

[29 CFR 1910.120](#), *Hazardous Waste Operations and Emergency Response*.

[29 CFR 1910.1200](#), *Hazard Communication*.

[40 CFR 68](#), *Chemical Accident Prevention Provisions*.

[40 CFR 355](#), *Emergency Planning and Notification*.

[40 CFR 302.4](#), *Designation, Reportable Quantities, and Notification*.

 [DOE O 151.1A](#), *Comprehensive Emergency Management System*.

[DOE O 232.1A](#), *Occurrence Reporting and Processing of Operations Information*.

Implementing Documents

SNL, [PN471011](#), *SNL/NM Emergency Plan*.

SNL/CA, [Procedure 210](#), *Emergency Plan Implementing Procedure*.

SNL/CA, *SNL/CA Emergency Plan*.

Related Documents

 SNL, [CPR400.1.1.32/MN471016](#), *Radiological Protection Procedures Manual*.

SNL/CA, *The Pocket Guide to Emergency Preparedness*.

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ES&H Manual

*SECTION 12A - ONSITE PACKAGING AND TRANSPORTATION (P&T) OF HAZARDOUS MATERIAL

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 - [12A-7](#) - Guidance for Onsite Transportation of Hazardous Material
- Forms
 - SF 2001-OCM, Onsite Chemical Move Checklist ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose activities involve packaging and [onsite](#) transportation of [hazardous material](#) that has **not** been determined to be waste.

Note: In addition to various contacts cited throughout this section, attachments 12A-1 through 12A-6 provide additional resources of information on a variety of relevant topics at specific sites where Sandia work is performed.

Site-Specific Applicability

[Table 1](#), "Site-Specific Applicability," provides site-specific information about the applicability of the requirements in this section at other Sandia-controlled and non-Sandia-controlled sites.

Table 1. Site-Specific Applicability.

Site	Site-Specific Applicability ¹
Sandia-controlled premises other than SNL/NM or SNL/CA (e.g., Tonopah Test range [TTR] and the Kauai Test Facility [KTF])	Sandia's requirements and practices apply, but are revised as necessary to comply with applicable state and local laws. Attachments 12A-1 through 12A-6 list site-specific contacts who can provide additional information.

Non-Sandia-controlled premises (e.g., the Nevada Test Site [NTS], Yucca Mountain facility, Pantex, and DoD facilities)

The requirements and practices of the host facility apply.

¹ Deviations from a host's procedures require the documented consensus of the host and the resident Sandia manager. Additional assistance is available from the appropriate [Division ES&H Team](#).

Exceptions to Applicability

[Table 2](#), "Exceptions to the Requirements for Onsite Transport of Hazardous Material," lists exceptions to the requirements of this section for the [onsite](#) transport of [hazardous material](#). These exceptions do **not** apply to Members of the Workforce whose activities involve [shipments](#) that are covered by Section 12B, "Offsite Shipment and Transport of Hazardous Material."

Table 2. Exceptions to the Requirements for [Onsite](#) Transport of [Hazardous Material](#)

Exception	Explanation
Emergency-response-related and security-related items and material when transported by a Member of the Workforce whose primary work responsibilities include Sandia physical security or Sandia emergency response.	This section does not apply to hazardous material, or any item containing hazardous material, that is routinely transported onsite for the purpose of emergency response or physical security at Sandia. These items and materials include, but are not limited to, fire extinguishers, breathing air cylinders, ammunition, and recovered spill residue.
Hazardous items or material that is required for facility maintenance or custodial services.	These items are excluded from the requirements of this section and include properly labeled welding gas cylinders, lecture bottles containing compressed gases for instrument calibration purposes, paint, and janitorial supplies.

<p>Radioactive material listed on the exempted items list in CPR400.1.1.32/ MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i>, Chapter 6, Attachment 6-2, “Exempted Items List.”</p>	<p>The items on this list are excluded from the requirements of this section if the item meets all of the criteria for an exempted item.</p>
<p>Subcontracted services.</p>	<p>The suppliers of subcontracted services (e. g. construction services, and the delivery and pickup of gas cylinders) are excluded from the requirements of this section unless specifically stated otherwise in an agreement (contract) between Sandia and the supplier.</p>
<p>Hazardous waste.</p>	<p>This section does not apply to the onsite transportation of hazardous waste. Consult the appropriate Division ES&H Team environmental representative for information about packaging and transportation of hazardous waste at SNL/ NM. At SNL/CA, see Section 19A, “Hazardous Waste Management,” and CPR400.1.1.37/GN470075, <i>Guidelines for Hazardous Waste Generators at SNL/CA</i>, for information on waste handling.</p>


TRAINING

Requirements

Managers shall be responsible for ensuring, that within 90 days of starting a job, all [HAZMAT-trained individuals](#) complete the required training specified in [Table 3](#), “[Training.](#)”

Note: If scheduling difficulties prevent HAZMAT-trained individuals from completing the required courses within the 90-day period, they should receive, at a minimum, general awareness, function-specific, and safety training.

Table 3. Training

Work Activity or Role	Required ¹
 <p>HAZMAT-trained individual</p>	<p>PKX100, mandatory.</p> <p>PKX111, PKX112, PKX114, PKX115, PKX130 and PKX150, as applicable.</p> <p>Consult the packaging and transportation training contact to determine course applicability to specific job functions and characteristics of the material to be transported on site.</p>
<p>¹ Refresher training for PKX courses is required every 36 months, except for PKX130, which requires refresher training every 24 months</p>	

ONSITE TRANSPORT OF HAZARDOUS MATERIAL

Note: By making a request for movement of [hazardous material](#), Members of the Workforce certify that they have complied with the requirements of this chapter. For questions and inquiries, consult the [packaging and transportation contact](#).




Fundamental

Requirements

Note: In addition to the fundamental requirements, the subtopics contain additional specific requirements for certain work activities. Both sets of requirements must be followed for full compliance.

Members of the Workforce, when transporting hazardous material [onsite](#), shall:

- Use only government vehicles or forklifts for transporting [hazardous material](#) **within** a technical area, **not** private or rental vehicles.
- Use only government vehicles for transporting hazardous material **between**




technical areas, **not** forklifts or private or rental vehicles.

- Secure hazardous material within a vehicle in a manner that prevents movement.

Members of the Workforce who develop [technical work documents](#) (TWDs), or test plans at TTR, that address onsite transportation activities shall:


- Consult a [HAZMAT-trained packaging and transportation \(P&T\) organization](#) prior to transport to determine TWD (or TTR) test plan requirements for the transport.
- Define requirements dependent upon the specific circumstances of the material.
- Develop and document TWDs in accordance with [Chapter 21](#), "Technical Work Documents (TWDs)."

- 
- Upon completion of the TWD (or TTR) test plan, the onsite transport portions of the document must be approved by the HAZMAT-trained packaging and transportation organization that would have had primary responsibility for movement of this material had there been no TWD (or TTR) test plan.

At TTR, [HAZMAT-trained individuals](#), when involved in a test, shall transport hazardous material according to a documented test plan that addresses transportation requirements for the test.

Guidance

Members of the Workforce should consult the [packaging and transportation contact](#) when they:

- 
- Have questions about or do not fully understand the requirements.
 - Are unable to comply with any of the requirements for [onsite](#) transportation.
 - Would like to request the use of a documented alternative process for onsite [hazardous material](#) transportation.

Members of the Workforce, when transporting hazardous material onsite, should use the guidance in [Attachment 12A-7, "Guidance for Onsite Transportation of Hazardous](#)

[Material,](#) and SF 2001-OCM, Onsite Chemical Move Checklist ([Word file](#)/[Acrobat file](#)).

Note: The [receiving and distributing organization](#) may transport unopened, DOT-packaged, limited quantities of [Radioactive material](#) onsite from the receiving location to its intended Sandia recipient when it is received as an inbound commercial [shipment](#).

Non-Radioactive Hazardous Material Transport

Requirements

In addition to the requirements listed under the subtopic, [Fundamental](#), Members of the Workforce, when transporting non-radioactive [hazardous material onsite](#), shall:

- Determine the hazard significance of the material per [Table 4](#), “Non-Radioactive Hazardous Material Significance.”
- Comply with the restrictions specified in [Table 5](#), “Additional Requirements for Onsite Transportation of Non-Radioactive Hazardous Material,” for the appropriate hazard significance.
- Comply with the requirements for high-hazard significance, if both high- and low-significance hazards are contained within a single package, and also comply with the additional restrictions in [Table 7](#), “Additional Restrictions for Transportation of Multiple Hazardous Materials.”
- Comply with the additional restrictions specified in [Table 7](#), “Additional Restrictions for Transportation of Multiple Hazardous Materials,” if transporting multiple packages of hazardous material.

Table 4. Non-Radioactive [Hazardous Material](#) Significance

Hazard Significance	Examples of Types (Numbers in parentheses represent hazard classes and divisions, as specified in 49 CFR 173.2 , “Hazardous Materials Classes and Index to Hazard Class Definitions.”)

High

[Explosives](#) (1.1, 1.2, 1.3).

Poison Gas (2.3) (e.g., bromine chloride, carbon monoxide, compressed, chlorine, ethylene oxide).

Dangerous When Wet (4.3) (e.g., sodium, sodium potassium alloy [NaK], lithium, calcium carbide).

Organic Peroxides (5.2) (e.g., crystallized chemicals, including isopropyl ether, divinyl ether, ethyl ether, tetrahydrofuran, styrene, vinyl chloride).

Poison-Inhalation Hazards (6.1 and 2.3) (e.g., hydrogen sulfide, arsine, hydrogen cyanide, hydrogen selenide).

Infectious substance (6.2), (any [42 CFR 72](#), “Interstate Shipment of Etiologic Agents” select agents (e.g., Ebola virus, Bacillus anthracis, Ricin), or [Biosafety Level 2](#) substance).

[Radioactive material](#) (7), (see subtopic, “[Radioactive Material Transport](#)”).

Low

All other hazardous materials, including:

- Explosives (1.4, 1.5, 1.6) (e.g., articles containing explosives, signal devices, smokeless powder).
- Flammable gases (2.1) (e.g., methane-refrigerated liquid, lighters, cryogenic liquids, compressed hydrogen).
- Non-flammable gases (2.2) (e.g., compressed nitrogen, compressed argon).
- Flammable liquids (3) (e.g., alcohol, xylene, gasoline, resin solutions, paint, acetone).
- Flammable solids (4.1) (e.g., magnesium, zinc resinate).
- Spontaneously combustible (4.2) (e.g., pentaborane, diethylzinc).



- Oxidizers (5.1) (e.g., inorganic nitrites, manganese nitrate).
- Poisons (other than inhalation hazards) (6.1) (e.g., chloroform, pesticides, arsenic).
- Corrosives (8) (e.g., batteries, mercury, sulfuric acid, nitric acid).
- Miscellaneous hazardous material (9) (e.g., lithium batteries) that is contained within equipment such as cell phones and laptop computers, or in [strong/tight](#), waterproof packaging that prevents short circuit.
- [Biosafety level 1](#) substance.



Table 5. Additional Requirements for [Onsite](#) Transportation of Non-Radioactive [Hazardous Material](#)

Hazard Significance	Transport Within a Technical Area ¹	Transport Between Technical Areas ^{2, 3}
High	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> • HAZMAT-trained packaging and transportation (P&T) organizations • HAZMAT-trained individuals • Members of the Workforce in a line organization with an approved applicable technical work document (TWD) 	<p>Only HAZMAT-trained packaging and transportation organizations are allowed to conduct the transport. In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> • A minimum of strong/tight packaging is used. • DOT labels are used. • One additional form of communication that identifies the material accompanies the transport



With the exception of those materials that pose poison-inhalation hazards, which must be transported by a HAZMAT-trained packaging and transportation organization only.

In addition, the following requirements must be met:

- A minimum of strong/tight packaging is used.
- Some form of communication that identifies the material accompanies the transport (e.g. marking, labeling, material safety data sheet [MSDS], transfer documentation).
- Packaging for infectious substances:
 - Is triple-wrapped (i.e., primary receptacle, water-tight secondary packaging, and durable outer packaging).
 - Has an "Infectious Substance" label affixed to the outside of the package.

(e.g. marking, MSDS, transfer documentation).

- Placarding is used, excluding for infectious substances.
- Packaging for infectious substances:
 - Is triple-wrapped (i.e., primary receptacle, water-tight secondary packaging, and durable outer packaging).
 - Has an "Infectious Substance" label affixed to the outside of the package.





<p>Low</p>	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained packaging and transportation (P&T) organizations ● HAZMAT-trained individuals ● Members of the Workforce in a line organization with an approved applicable technical work document (TWD) or without an approved applicable TWD <p>In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> ● A minimum of strong/tight packaging is used. 	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained P&T organizations ● HAZMAT-trained individuals <p>In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> ● A minimum of strong/tight packaging is used. ● Some form of communication that identifies the material accompanies the transport (e.g. marking, labeling, MSDS, transfer documentation).
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¹ "Within a technical area" is recognized as transportation within or between buildings inside a single controlled access area. Transport between SNL/NM technical areas III and V is a recognized exemption. These areas are considered to be within a single technical area if accessed using the paved road (corridor) that runs directly from Technical Area V, in front of Building 6585, and ending at the vehicle gate entrance to Technical Area III. At TTR, transport on roads having a posted speed limit of 25 mph or less is considered to be "within a single technical area." Transport at SNL/CA and KTF is considered to be "within a single technical area" because these sites are located wholly within a controlled access area.

² At TTR, transport on roads having a posted speed limit in excess of 25 mph is considered to be a "between technical areas" move, unless otherwise documented in a test plan.

³ "Between technical areas" at SNL/NM is recognized as transportation between Sandia-controlled access areas (e.g., Technical Area I to Technical Area V, Coyote

Canyon to Technical Area V, Technical Area II to Technical Area III, Manzano bunkers to Technical Area I). "Between technical areas" also includes transport such as that between Technical Area I and Building 897 because persons must exit the controlled access area of Technical Area I to access this building (even though Sandia considers these buildings to be a part of Technical Area I).

Radioactive Material Transport

Requirements

Members of the Workforce shall follow the non-routine transfer process if an [onsite](#) transfer of [hazardous material](#) meets one or more of the following criteria:

- The DOT threshold quantities for being designated Highway Route Controlled material.
- The DOT threshold quantities to require an exclusive-use vehicle (e.g. dose rate greater than 200 mrem/hr at contact on the surface of the outer packaging and a transport index greater than 10).
- Results in a [criticality index \(CI\)](#) greater than 50 on a single vehicle.

Note: For other situations or isotopes not addressed in this table, consult the [packaging and transportation contact](#) to identify requirements.

In addition to the [Fundamental](#) requirements, Members of the Workforce, when transporting [radioactive material](#), shall:

- Consult radiation-protection personnel on the appropriate [Division ES&H Team](#) to arrange for radiation and contamination surveys of record or documented survey exemptions.
- **Not** transport radioactive material onsite that has removable contamination on the surface of the outer package that exceeds the limits specified in CPR400.1.1.32/ MN471016, *Radiological Protection Procedures Manual (RPPM)*, [Attachment 6-1](#), "Radioactive Contamination Limits," until the material is over-packed or decontaminated such that the contamination levels fall below the Attachment 6-1 limits.

- Stage and transport fissile materials in accordance with CPR 400.1.1.11/[GN470072](#), *Nuclear Criticality Safety*.
- Compare isotope and quantity of material to [DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, [Table A.1](#), “Thresholds for Radionuclides.” If the material exceeds the lower threshold for hazard category 3 radioactive material according to Standard 1027, **do not** refer to Table 6. Only a Sandia organization operating under the authority of an approved [Documented Safety Analysis](#) is permitted to move the material. Consult the SNL/NM onsite [packaging and transportation organization](#).



Note: SNL/CA and TTR do not have this type of material.

- Determine the significance of the radioactive material per [Table 6](#), “Additional Requirements for Onsite Transport of Radioactive Material,” and follow the corresponding requirements for that significance. If there is more than one significance of radioactive material in a single package, follow the requirements for the higher significance.
- If a single package contains radioactive material and non-radioactive material, follow the more rigorous of the applicable [Table 5](#), “Additional Requirements for Onsite Transportation of Non-Radioactive Hazardous Material,” or [Table 6](#) requirements. Also follow the additional restrictions in [Table 7](#), “Additional Restrictions for Transportation of Multiple Hazardous Materials.”
- If transporting multiple packages of hazardous materials, comply with the additional restrictions specified in [Table 7](#).



Table 6. Additional Requirements for [Onsite](#) Transport of [Radioactive Material](#) ¹

Significance of Radioactive Material (RM)	Requirements for Transportation Within Technical Areas ^{2, 3}	Requirements for Transportation Between Technical Areas ^{3, 4}
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Total RM, sources, or samples in the package is greater than or equal to CPR400.1.1.32/ MN471016, *Radiological Protection Procedures Manual (RPPM)*, [Appendix E](#) values

OR

The dose rate is greater than or equal to 10 mrem/hr at contact on the surface of the outer packaging.

Any of the following are allowed to conduct the transport:

- [HAZMAT-trained packaging and transportation \(P&T\) organizations](#)
- [HAZMAT-trained individuals](#)
- Members of the Workforce in a line organization with an approved applicable technical work document ([TWD](#))

In addition, the following requirements must be met:

- A minimum of [strong/tight packaging](#) and tie-downs are used.
- A "Caution Radioactive Materials" label is affixed to the outer package.
- A Rad Yellow III label is affixed if the dose rate is greater than 50 mrem/hr at contact on the surface of the outer packaging.
- Transfer

The transport shall be conducted by a HAZMAT-trained packaging and transportation organization. In addition, the following requirements must be met:

- A minimum of [strong/tight packaging](#) is used.
- A "Caution Radioactive Materials" label is affixed to the outer package.
- A Rad Yellow III label and vehicle placarding are affixed if the dose rate is greater than 50 mrem/hr at contact on the surface of the outer packaging.
- Transfer documentation that identifies the material accompanies the transport.



<p>Total RM, sources, or samples in the package is greater than or equal to 1/10 but less than CPR400.1.1.32/ MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i>, Appendix E values</p> <p style="text-align: center;">OR</p> <p>The dose rate of the RM, sources, or samples in the package is greater than or equal to 2 mrem/hr but less than 10 mrem/hr at contact on the surface of the outer packaging</p>	<p>documentation or an approved applicable TWD, which identifies the material, accompanies the transport.</p> <p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained P&T organizations ● HAZMAT-trained individuals ● Members of the Workforce in a line organization with an approved applicable technical work document (TWD) <p>In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> ● A minimum of strong/ tight packaging is used. ● A "Caution Radioactive Materials" label is affixed to the outer package. 	<p>The transport shall be conducted by a HAZMAT-trained packaging and transportation organization. In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> ● A minimum of strong/ tight packaging is used. ● A "Caution Radioactive Materials" label is affixed to the outer package. ● Transfer documentation that identifies the material accompanies the transport.
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<p>Total RM, sources, or samples in the package is greater than or equal to 1/10 of RPPM but less than CPR400.1.1.32/ MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i>, Appendix E values</p> <p style="text-align: center;">AND</p> <p>The dose rate is less than 2 mrem/hr at contact on the surface of the outer package.</p>	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained P&T organizations ● HAZMAT-trained individuals ● Members of the Workforce in a line organization with an approved applicable technical work document (TWD) or without an approved applicable TWD <p>In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> ● A minimum of strong/tight packaging is used. ● A "Caution Radioactive Materials" label is affixed to the outer package. 	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained P&T organizations ● HAZMAT-trained individuals <p>In addition, the following requirements must be met:</p> <ul style="list-style-type: none"> ● A minimum of strong/tight packaging is used. ● A "Caution Radioactive Materials" label is affixed to the outer package.
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Total RM, sources, or samples in the package is less than 1/10 of CPR400.1.1.32/ MN471016, *Radiological Protection Procedures Manual (RPPM)*, [Appendix E](#) values, and the dose rate is greater than 0.5 mrem/hr but less than 2 mrem/hr at contact on the surface of the outer packaging.

OR

The activity or the isotope is unknown and the dose rate is less than 2 mrem/hr at contact on the surface of the outer packaging.

Any of the following are allowed to conduct the transport:

- HAZMAT-trained P&T organizations
- HAZMAT-trained individuals
- Members of the Workforce in a line organization with an approved applicable technical work document (TWD) or without an approved applicable TWD

In addition, the following requirements must be met:

- A minimum of strong/ tight packaging is used.

Any of the following are allowed to conduct the transport:

- HAZMAT-trained P&T organizations
- HAZMAT-trained individuals
- Members of the Workforce in a line organization with an approved applicable technical work document (TWD) or without an approved applicable TWD

In addition, the following requirements must be met:

- A minimum of strong/ tight packaging is used.
- Some form of communication that identifies the material accompanies the transport (e.g., marking, labeling, and transfer papers).



<p>Total RM, sources, or samples in the package is less than 1/10 of CPR400.1.1.32/ MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i>, Appendix E values and the dose rate is less than 0.5 mrem/hr at contact on the surface of the outer packaging.</p> <p style="text-align: center;">OR</p> <p>Radioactive samples for laboratory analysis is less than 0.5 mrem/hr at contact on the surface of the outer packaging.</p>	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained P&T organizations ● HAZMAT-trained individuals ● Members of the Workforce in a line organization with an approved applicable technical work document (TWD) or without an approved applicable TWD 	<p>Any of the following are allowed to conduct the transport:</p> <ul style="list-style-type: none"> ● HAZMAT-trained P&T organizations ● HAZMAT-trained individuals ● Members of the Workforce in a line organization with an approved applicable technical work document (TWD) or without an approved applicable TWD
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¹ For other situations or isotopes not addressed in this table, consult the [packaging and transportation contact](#) to identify requirements.


² "Within a technical area" is recognized as transportation within or between buildings inside a single [controlled access area](#). Transport between SNL/NM technical areas III and V is a recognized exemption. These areas are considered to be within a single technical area if accessed using the paved road (corridor) that runs directly from Technical Area V, in front of Building 6585, and ending at the vehicle gate entrance to Technical Area III. At TTR, transport on roads having a posted speed limit of 25 mph or less is considered to be "within a single technical area." Transport at SNL/CA and KTF is considered to be "within a single technical area" because these sites are located wholly within a controlled access area.

³ Transport at TTR, on roads having a posted speed limit in excess of 25 mph, follows the requirements for "between technical area" moves unless otherwise documented in a test plan.

⁴ "Between technical areas" at SNL/NM is recognized as transportation between controlled access areas (e.g., Technical Area I to Technical Area V, Coyote Canyon to

Technical Area V, Technical Area II to Technical Area III, Manzano bunkers to Technical Area I). “Between technical areas” also includes transportation such as that between Technical Area I and Building 897 because persons must exit the controlled access area of Technical Area I to access this building (even though Sandia considers this building to be a part of Technical Area I).

Table 7. Additional Restrictions for Transportation of Multiple [Hazardous Materials](#)

Topic	Restriction
 <p>Communication that there is more than one hazard within a single package.</p>	<p>Communication (e.g., labeling, transfer documentation) must identify the predominant hazards of the materials within the package and must accompany the transport.</p> <p>For assistance in identifying transport of this type, consult the packaging and transportation contact.</p>
<p>Separation and segregation of more than one package containing hazardous material within a single vehicle.</p>	<p>Multiple hazardous material packages must not be loaded or transported together unless that material is properly separated or segregated.</p> <p>For assistance identifying transport of this type, consult the packaging and transportation contact.</p>



RESPONDING TO PACKAGING AND TRANSPORTATION EMERGENCIES

Requirements

Members of the Workforce who are involved in a transportation or handling incident that involves [hazardous material](#) shall perform the following actions (referred to as the GIN principle), in the order specified:

1. **Get away from the material.**

2. **Isolate the area and deny entry.**

3. **Notify [emergency response personnel](#) and report the type and quantity of the material.**

Note: When unsure whether an emergency exists, assume that one does and call the appropriate [emergency phone number](#) in Chapter 15, "Emergency Preparedness and Management."

Members of the Workforce shall follow the requirements of [Section 18C](#), "Occurrence Reporting," when reporting a hazardous-material release.

Guidance

Members of the Workforce should consult the [packaging and transportation contact](#) for assistance in determining reporting requirements.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to packaging and transportation of [hazardous material](#) include:

Hazard/Activity	Reference
Accountable nuclear material transportation	<p>CPR400.3.14, <i>Management of Accountable Nuclear Material</i>.</p> <p>SNL/NM-MC&A 97-0900, <i>Nuclear Material Custodian Procedures Manual</i> (applies to all sites except SNL/CA).</p> <p>SAND 83-8036C, <i>Nuclear Material Operations Manual</i> (applies only to SNL/CA).</p>

<p>Authorization basis process</p>	<p>Section 13C, "Authorization Basis Process."</p>
<p>ES&H Events</p>	<p>Section 18C, "Occurrence Reporting."</p>
<p>Explosive material</p>	<p>DOE M 440.1-1, <i>DOE Explosives Safety Manual</i>.</p> <p>Chapter 9, "Explosives Safety."</p> <p>Kirtland Air Force Base regulations (Consult the appropriate Division ES&H Team for assistance).</p> <p>Department of Defense requirements (Consult the appropriate Division ES&H Team for assistance).</p>
<p>Federal motor carrier safety regulations</p>	<p>Section 12C, "Commercial Motor Vehicles (CMV) and Commercial Driver's Licenses (CDLs)."</p> <p>FMCSR Compliance Manual and Drug & Alcohol Policy Statement.</p> <p>CPR400.1.1.17/GN470084, <i>Complying With Federal Motor Carrier Safety Regulations</i>.</p>
<p>Nuclear criticality safety</p>	<p>CPR400.1.1.11/GN470072, <i>Nuclear Criticality Safety</i>.</p>
<p>Onsite transportation of classified hazardous material</p>	<p>SNL/NM-CMPC-96-7442-01, <i>Classified Material Control Procedures Manual</i> (applies to all sites except SNL/CA).</p> <p>CPR400.3.12, <i>Management of Classified Matter</i>.</p> <p><i>Classified Procedures Manual</i> (applies only to SNL/CA).</p>
<p>Radioactive material</p>	<p>CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual</i>.</p>





[Technical work documents](#) (TWDs)


[Chapter 21](#), “Technical Work Documents (TWDs).”

REFERENCES

Requirements Source Documents

10 CFR 830, *Nuclear Safety Management*, [Subpart B](#), “Safety Basis Requirements.”

[49 CFR 171](#), *General Information, Regulations, and Definitions*:

- 
- [49 CFR 171.15](#), *Immediate Notice of Certain Hazardous Materials Incidents*.
 - [49 CFR 171.16](#), *Detailed Hazardous Materials Incident Reports*.

[49 CFR 172](#), *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements*:


- [49 CFR 172.704](#), *Training Requirements*.

[49 CFR 173](#), *Shippers—General Requirements for Shipments and Packagings*.

[49 CFR 177.842](#), *Class 7 (Radioactive) Material*.

[DOE O 460.1B](#), *Packaging and Transportation Safety*.

Implementing Documents



SNL, CPR400.1.1.17/[GN470084](#), *Complying With Federal Motor Carrier Safety Regulations*.

SNL, CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.

SNL, CPR400.1.1.31/[MN471011](#), *Explosives Safety Manual*.

SNL/CA, SAND 83-8036C, *Nuclear Material Operations Manual*.

SNL/NM-CMPC-96-7442-01, *Classified Material Control Procedures Manual*.

SNL/NM-MC&A 97-0900, *Nuclear Material Custodian Procedures Manual*.

Related Documents

[49 CFR 100 – 185](#), *Research and Special Programs Administration, Department of Transportation* (except 171, 172, 173, and 177).

[49 CFR 177.848](#), *Segregation of Hazardous Materials*.

[Biosafety in Microbiological and Biomedical Laboratories \(BMBL\)](#).

[DOE N 441.1](#), *Radiological Protection for DOE Activities*.

[DOE O 460.2](#), *Departmental Materials Transportation and Packaging Management*.

[DOE O 461.1](#), *Packaging and Transfer or Transportation of Materials of National Security Interest*.



[Back to Chapter Contents](#)

[Forward to Next Section](#)



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ES&H Manual

* ATTACHMENT 19B-1 – RELEASE OF NON-RADIOACTIVE WASTE

Subject Matter Expert: [Phil Zelle](#); CA Counterpart: [Mark Brynildson](#)

MN471001, Issue M

Revision Date: [June 15, 2006](#); Replaces Document Dated: January 21, 2005

Review Date: December 9, 2004

APPLICABILITY

The exemptions for naturally occurring radioactive material ([NORM](#)) and for consumer products, as described in this attachment, do **not** apply to SNL/CA.

[Radioactive waste](#) is prohibited from disposal in solid waste landfills and Resource Conservation and Recovery Act (RCRA) treatment, storage and disposal facilities (TSDFs) unless those facilities are appropriately licensed by an agreement state or by the Nuclear Regulatory Commission (NRC) to receive such waste. Since radioactive materials are prevalent in nature and in common products, it is necessary to distinguish between waste that must be regulated as radioactive waste and waste that is not regulated.

RELEASE CRITERIA

Requirements

[Primary waste generators](#) and [waste custodians](#) shall use the following release criteria to determine and document if waste can be managed and disposed of as non-radioactive waste:

Note: For wastes with no reasonable potential for Sandia-added [residual radioactivity](#), these criteria may be met by process knowledge.

- Residual surface radioactivity on the waste is as low as reasonably achievable and below the [authorized limit](#) for unrestricted release, as found in CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, Chapter 6, "Control of Radioactive Material," [Attachment 6-1](#), "Radioactive Contamination Limits."
- The waste is determined to contain no detectable Sandia-added residual radioactivity in mass or volume, using detection methods described in [PLA 94-40](#), *Program Plan for Managing Radioactive Material Management Areas (RMMAs)*, and include process knowledge.
- The waste contains only [NORM](#), which has **not** been enhanced by a Sandia process.
- The waste consists of consumer products that are exempt from licensing as [by-product](#) or [source material](#), as defined under the topic, "Consumer Products," below.
- The waste contains SNL-added residual radioactivity that does **not** meet the criteria stated above, but for which DOE-approved authorized limits (dose or risk-based limits) have been established, provided:
 - The receiving facility is notified of the authorized limits and accepts custody of the waste.
 - The radiation control authority for the NRC or the agreement state concurs with the established limits.
 - If applicable, any restrictions established as part of the authorized limit approval (i.e., specific disposal facility, specific handling precautions, etc.) can be demonstrated to be in place.

Note: The above release criteria are intended to meet the general prohibition on disposal of radioactive waste at solid and hazardous waste disposal facilities. More restrictive release criteria may be developed on a case-by-case basis to meet specific waste acceptance criteria imposed by a receiving disposal facility.



*CONSUMER PRODUCTS

*Requirements

[Primary waste generators](#) and [waste custodians](#) shall **not** bulk together exempt items in such a manner as to pose a potential radiological hazard and dispose of them as solid waste.

Note: If items are bulked together so as to pose a potential radiological hazard, the waste **shall** be controlled as [radioactive](#) or [mixed waste](#), as appropriate.



Guidance

Consumer products that are exempt from licensing are exempt because, individually, they do not pose a radiological risk to users, the environment, or the public. The same generally applies to items containing only NORM. However, this may not be the case if many such items are accumulated in a single waste container.

Consumer products are identified as exempt by the State of New Mexico Radiation Control Bureau (as defined in [20 NMAC 3.1, Subpart 3, Licensing of Radioactive Material](#)) or by the NRC (see [10 CFR 30, Rules of General Applicability to Domestic Licensing of Byproduct Material](#), and [10 CFR 40, Domestic Licensing of Source Material](#)), provided all of the following conditions are met:

- The consumer products were not manufactured by SNL.
- The consumer products were purchased and used by SNL for their intended purpose and in their intended configuration.
- The radioactive content of the consumer products has not been enhanced in an SNL process.

Note: See CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, Chapter 6, "Control of Radioactive Material," [Attachment 6-2](#), "Exempted Items List."



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Corporate Process Requirement No: CPR400.1.1
Sponsor: Dori Ellis, 4000, Acting

Revision Date: June 22,
2006

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 21 – TECHNICAL WORK DOCUMENTS (TWDs)

Subject Matter Experts: [Lynn Fondren](#); CA Counterpart: [Donn Wright](#)

Contributor: [Steve Coffing](#)

MN471001, Issue D

Revision Date: [June 22, 2006](#); Replaced Document Dated: February 25, 2004

* Indicates a substantive change

- [*Applicability](#)
- [*Developing TWDs and Determining Need](#)
- [*Incorporating ISMS Into TWDs](#)
- [*Additional Elements of a TWD](#)
- [*Skill-of-the-Worker](#)
- [*Review and Approval of TWDs](#)
- [*Related Activities Requiring Documentation](#)
- [References](#)
- Attachments:
 - 21-1 - Sample Authorized Users' List ([Word file](#)/[Acrobat file](#))
 - [21-2](#) - Guidelines for Writing Step-by-Step Instructions
 - [21-3](#) - Optional Methods of Document Control

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce who develop, review, or approve [technical work documents \(TWDs\)](#). This section communicates requirements and guidance developed for hazardous work activities conducted by Members of the Workforce.

This section does **not** apply to environmental permits including the following:

- Burning (Open Burn Permit)
- Construction (Preconstruction Permit)
- Hazardous waste, less-than-90-day accumulation area (Contingency Plan)
- Onsite packaging and transportation (P&T) or transfer of hazardous material by non-P&T Members of the Workforce (procedure).
- Planned release of any process-related solid, liquid, or gas into the environment or sewer system (procedure)
- Surface disturbance (Surface Disturbance/Demolition Permit)

*DEVELOPING TWDs AND DETERMINING NEED

Requirements

Managers shall be responsible for ensuring that:

- The identification of and associated controls for activity-level work hazards is communicated and provided to Members of the Workforce.
- TWDs are developed for work activities when:
 - The [primary hazard screening \(PHS\)](#) or Hazard Analysis (HA) process indicates a TWD is required to address specific hazards or conditions (see [Chapter 13](#), "Hazard Identification/Analysis, and Risk Management").
 - Organizational requirements indicate a TWD is required (e.g., a conduct of operations or quality assurance plan may indicate the need and method for developing a TWD).
 - The level of experience, certification, or qualifications of Members of the Workforce who perform hazardous work activities are not sufficient to provide adequate assurance that associated hazards will be adequately controlled (see "[Skill-of-the-Worker](#)").
 - Regulatory drivers or implementing documents, as required throughout the [ES&H Manual](#) and its supplements, mandate their use as an [administrative control](#).
 - **Recommended by their Division ES&H Team to document activity-level hazards and associated control measures for a specific work activity.**
- The use of a TWD is required for the following work activities:

Work Activity	Required TWD Type	Additional Information
Biological agents	Biosafety or Operations Manual	Section 6N , "Biological Agents and Biosafety"
Bloodborne pathogens	Procedure	CPR400.1.1.19/ GN470086 , <i>SNL Bloodborne Pathogens Exposure Control Plan</i>
Beryllium that may be released as an airborne particulate	Chronic Beryllium Disease Prevention Plan	Section 6D , "Hazard Communication Standard"

Commercial Underwater Diving	Safe Practices Manual	Section 6F , "Commercial Underwater Diving"
Confined space entry	Permit for permit required confined space OR Procedure for non-permit confined space	Section 6I , "Confined Space Entry at SNL/NM"
Construction & construction-like work	Permit(s) Project safety plan	Section 4V , "ES&H for Contracted Construction and Construction-Like Activities"
Electrical	Procedure if greater than 50 volts and potential for exposure.	CPR400.1.1.28/ MN471004 , <i>Electrical Safety Manual</i> , Chapter 2, Section 2.3 , "Work Procedures," and Chapter 4, Section 4.5 , "Power Sources"
Energized equipment	Procedure	CPR400.1.1.7/ GN470037 , <i>Lockout/Tagout Procedure for the Control of Hazardous Energy</i>
Evacuation planning/preparedness for facilities or buildings	A facility- or building-specific written evacuation/emergency plan	Chapter 15 , "Emergency Preparedness and Management"
Excavations, trenches, and floor or wall penetrations	Hidden hazards penetration permit	Section 4H , "Excavations, Trenches, and Floor or Wall Penetrations"
Explosives	Procedure	CPR400.1.1.31/MN471011, <i>Sandia Explosives Safety Manual</i> , Chapter VII , "Operating Procedures"

<p>Hazardous chemicals in Laboratory Standard work areas (see definitions for physical hazard or health hazard)</p>	<p>Procedure</p>	<p>Section 6E, "Laboratory Standard – Chemical Hygiene Plan"</p>
<p>Hazard Communication (HAZCOM) work areas with airborne concentrations of carcinogens that exceed OSHA action levels or ACGIH Threshold Limit Values (TLVs)</p>	<p>Procedure</p>	<p>Section 6D, "Hazard Communication Standard"</p>
<p>Hazardous Material (HAZMAT) Response Team</p>	<ul style="list-style-type: none"> ○ Emergency response plan ○ Procedure 	<p>Section 6K, "Hazardous Waste Operations and Emergency Response (HAZWOPER)"</p>
<p>Hazardous waste cleanup operations (environmental restoration [ER] sites)</p>	<ul style="list-style-type: none"> ○ Safety and health program ○ Site-specific health and safety plan (HASP) ○ Procedure 	<p>Section 6K, "Hazardous Waste Operations and Emergency Response (HAZWOPER)"</p>

Hazardous waste operations at treatment, storage, and disposal (TSD) facilities	<ul style="list-style-type: none"> ○ Safety and health program ○ Procedure 	Section 6K , "Hazardous Waste Operations and Emergency Response (HAZWOPER)"
Hot work	Hot Work Permit	Section 4E , "Hot Work Safety"
Ionizing Radiation (Radioactive Material/ Radiological Hazards)	Procedure	CPR400.1.1.32/ MN471016 , <i>Radiological Protection Procedures Manual</i> , Chapter 1, "Radiological Work Planning and Controls," Section 4.3.2 and Chapter 6, "Control of Radioactive Material," Section 4.2.1
Lasers (class 3b and 4)	Procedure	Section 6G , "Lasers and Intense Light"
Nuclear facilities procedures	Procedure	DOE 5480.6 , Safety of DOE-Owned Nuclear Reactors
Pressure, vacuum, and cryogenic systems	Data package	CPR400.1.1.27/ MN471000 , <i>Pressure Safety Manual</i> , Chapter 9 , "Documenting the Operational Safety of Pressure Systems"
	Pressure Safety Analysis Report (PSAR)	CPR400.1.1.27/ MN471000 , <i>Pressure Safety Manual</i> , Chapter 9 , "Documenting the Operational Safety of Pressure Systems"

Respiratory protection equipment for emergency and rescue use	Procedure	Section 6C , "Respiratory Protection"
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Managers who develop [TWDs](#) shall meet the records retention and disposition requirements specified in [CPR400.2.13.14](#), Records Retention and Disposition Schedule & Processes, and implemented in [CPR400.2.13.14A](#), Sandia Records Retention and Disposition Schedule, Record Series Number ES-110-205-000, ES&H Standard Operating Procedures (SOP or SP), Safe Work Permit (SWP), and ES&H Operating Procedure (OP) Records.

Guidance

TWDs should be developed to identify all activity-level work hazards and their associated work controls for a specific work activity, including work activities that do not require a TWD, as a method for Managers to communicate and provide identification of and associated controls for activity-level work hazards to Members of the Workforce. A TWD is an effective communication method for activity-level work hazards that provides identification and identifies control measures using the ISMS approach (see "Incorporating ISMS into TWDs").

Managers should:

- Involve their Division ES&H Team and solicit input from Members of the Workforce early in the development process.
- Contact their Division ES&H Team if assistance is necessary to develop an effective TWD that documents all activity-level hazards and associated control measures for a specific work activity.

TWDs should be developed when recommended by their Division ES&H Team to document activity-level hazards and associated control measures for a specific work activity.

For TWDs implemented by multiple organizations, each manager should negotiate a process to authorize their organization's Members of the Workforce to conduct work covered in the specified TWD (e.g., the authorized users list).

For operations that have multiple types of [hazards](#) that require ES&H review (e.g., radiological and chemical), managers should involve appropriate [Division ES&H Team](#) member(s) and facility or project Members of the Workforce from each hazard area in the TWD development and review process.

When developing procedures at SNL/CA for one-time operations, short-duration projects, short-term maintenance jobs, decontamination jobs, and proof-of-loss activities, Members of the Workforce should see SNL/CA OP471382, *Administrative Procedure for the Development of Safe Work Permits*.

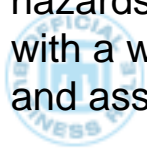


*INCORPORATING ISMS INTO TWDs

Requirements

Managers are responsible for ensuring that the [five safety management functions](#) of ISMS are observed when developing a TWD as follows.

Note: The five safety management functions provide the necessary structure for any work activity that could potentially affect the workers, the public, and the environment. When work activities are planned, associated hazards are identified, analyzed and controlled using the ISMS approach. The functions are applied as a continuous cycle with a degree of rigor that is appropriate to address the type of work activity and the hazards involved. The TWD is used to document the activity-level hazards associated with a work activity and to communicate the identification of activity-level work hazards and associated controls.



Step	Action

1. Define the Scope of Work



The TWD shall limit the scope of work activities by defining the scope of work covered in the TWD.

- Ensure that TWD procedures will **not** exceed the bounds of the governing primary hazard screening ([PHS](#)) (e.g., location, scope of work, [hazards](#)).
- Identify Authorized Users that will be authorized to implement procedures. Describe the duties of Authorized Users that are unique to the activity, and include interfaces with other organizations.
- Specify where the work will be conducted and to which piece(s) of equipment the procedure applies.

2. Analyze the Hazards

- Hazards associated with the work activities are identified, analyzed and categorized. All hazard categories from the facility's PHS are reviewed to identify hazards to be analyzed.
- Each hazard or work activity that the PHS indicates a TWD is required shall be identified in the TWD.

Note: The [Index of Hazards](#) may also be consulted for a listing of additional hazards to be considered in this ISMS core function. Current [work planning processes](#) within the organizations that include applicable facility requirements and work controls are also implemented.

 <p>3. Develop and Implement Hazard Controls</p>	<p>The TWD shall communicate and document control measures implemented for each hazard identified. All TWD requirements as directed by specific work activities shall be incorporated into the TWD (see “Developing TWDs and Determining Need”). The TWD shall incorporate controls steps at appropriate places (such as hold points where ES&H support personnel must provide monitoring or surveillance). Verification checks by an observer should be considered if a mistake could result in injury or a release of hazardous material. Include emergency actions where necessary.</p>
 <p>4. Perform Work within Controls</p>	<p>TWDs are approved and signed prior to work being performed. The manager shall determine when a revision is necessary, the frequency, and the extent of review and re-approval required to adequately control hazards. Lower-tier documents that are attached to or referenced by a TWD shall be included in the review/revision of the parent document. Authorized users are required to read the TWD and confirm their status as an authorized user by signing the TWD. Work is performed safely within control measures established and communicated by the TWD. Work is not permitted to be performed outside the controls established for the activity-level hazards identified in the TWD.</p>
<p>5. Provide Feedback and Continuous Improvement</p>	<p>TWDs allow for feedback and continuous improvement by soliciting feedback for continuous improvement from users and identifying the author and responsible manager. Feedback information on the adequacy of controls is gathered, opportunities for improving the planning of work is identified and implemented, and, if necessary, regulatory enforcement actions occur.</p>

Members of the Workforce shall observe the hazard [control measures](#) hierarchy, which involves implementing engineering controls, administrative controls, and PPE, when developing and implementing hazard controls. Consult the appropriate [Division ES&H Team](#) for assistance with identifying appropriate controls if necessary.

Guidance

Completed TWDs should indicate that the [five safety management functions](#) of ISMS were observed in the development of the TWD.

Managers should ensure that TWDs are reviewed and updated, as soon as practical, when recommended improvements to a TWD that improve the safety of covered work activities are feasible to improve the safety of a project.

*ADDITIONAL ELEMENTS OF A TWD

Requirements

Managers are responsible for ensuring that for each work activity included in a TWD that has been written for health and safety work activities addresses the following:

- All activity-level hazards and associated controls are documented to communicate to Members of the Workforce the activity-level work hazards and associated work [control measures](#) during normal activities or foreseeable emergencies.
- Work control measures are clearly assigned to their associated activity-level hazards identified within the TWD.
- All requirements for TWDs are included in a TWD for work activities when a TWD is required.
- **Conflict or contradiction between TWDs involving the same location or hazards.** TWDs involving the same location or hazards shall reference one another and make clear under what conditions each TWD shall be used.

Note: Specific TWD requirements and guidance for specific work activities appear throughout the ES&H Manual. See "[Developing TWDs and Determining Need](#)," for hazards and work activities that have specific TWD requirements.

- TWDs are revised, as applicable, to reflect current hazards and controls.
- TWDs are removed from service when no longer needed.

Guidance

A TWD may be developed as a written certification of a [workplace assessment](#) designed to determine if hazards are present, or likely to be present, that necessitate the use of PPE (see [Section 4L](#), “Personal Protective Equipment (PPE)” for additional information on workplace assessments).

The manager who owns a procedure has approval authority. If the procedure involves multiple organizations, the owning manager should secure an agreement with the manager of other affected organizations. This can be done informally (through e-mail or phone discussions) or formally (through a memorandum of understanding [MOU]).

Each procedure should contain an approval page signed and dated by the owning manager, as well as a reviewer page that includes names, signatures, and dates of review.

*SKILL-OF-THE-WORKER

Requirements

Managers are responsible for:

- Determining when the [skill-of-the-worker](#) is sufficient to provide adequate assurance that associated hazards of a specific activity-level work hazards will be adequately controlled.

Note: The skill-of-the-worker may be used in place of a TWD when the level of experience, certification, or qualifications of Members of the Workforce who perform hazardous work activities are sufficient to provide adequate assurance that associated hazards will be adequately controlled. This responsibility requires the manager to adequately judge and accept the risk involved, depending upon when the skill-of-the-worker is an adequate control for activity-level hazards.

- Recognizing that the skill-of-the-worker must not be used in place of a TWD when a TWD is required (See “[Developing TWDs and Determining Need](#)”).

- Developing and documenting criteria for specific work activities that authorize Members of the Workforce to perform those specific work activities as a skilled worker.

Note: Members of the Workforce who are not authorized as a skilled worker, but perform work alongside skilled workers, are considered an activity-level hazard. (See “Developing TWDs and Determining Need”).

- Authorizing and documenting which Members of the Workforce meet the skill-of-the-worker criteria for specific work activities.

- Consulting with their [Division ES&H Team](#) to determine if a TWD is an appropriate control for hazardous work activities that do not require use of a TWD.

Guidance

Managers should determine if a TWD is an appropriate control for work activities that do not specifically require the use of a TWD. The safety of a work activity can be increased with a TWD, even in instances when the skill-of-the-worker is considered sufficient to control hazards. Managers should consult with their [Division ES&H Team](#) to determine if a TWD is an appropriate control for work activities that do not require use of a TWD.

*REVIEW AND APPROVAL OF TWDs

Requirements

Managers are responsible for ensuring that:

- TWDs are approved and signed by the appropriate Members of the Workforce before the work activities are performed. Specific requirements and guidance on approvals and signatures appear in the respective ES&H Manual sections as described in “[Developing TWDs and Determining Need](#),” for select hazards and work activities that require a TWD.
- Only authorized users of a TWD are permitted to perform work covered by a TWD.

Members of the Workforce shall contact their [Division ES&H Team](#) to obtain:

- Assistance with the identification and evaluation of hazards, [control measures](#), [personal protective equipment \(PPE\)](#), and monitoring requirements.
- A technical review of TWDs to control hazardous work activities.
- Assistance with procedure [walk downs](#) when TWDs are used as a control for hazardous work activities.

Note: Industrial hygiene (IH) approval is required for TWDs, unless an established approval process exists for a specific hazard addressed in the ES&H Manual (e.g., Section 6I, "Confined Space").

RELATED ACTIVITIES REQUIRING DOCUMENTATION

Other ES&H activities requiring documentation:

Activity (Document Type)	Reference
Burning (Open Burn Permit)	Section 17B , "Air Permits"
Construction (Preconstruction Permit)	Section 17B , "Air Permits "
Hazardous waste, less-than-90-day accumulation area (Contingency Plan)	Section 19A , "Hazardous Waste Management" Attachment 19A-1 , "Managing Hazardous Waste at a Less-Than-90-Day Accumulation Area"
Onsite packaging and transportation (P&T) or transfer of hazardous material by non-P&T Members of the Workforce (Procedure or RWP)	Chapter 12 , "Packaging and Transportation of Hazardous Material," "Onsite Packaging and Transportation"

Planned release of any process-related solid, liquid, or gas into the environment or sewer system (Procedure)	Section 18E , "Environmental Release Reporting"
Surface Disturbance (Surface Disturbance/Demolition Permit)	Section 17B , "Air Permits"

REFERENCES

Requirements Source Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*

Implementing Documents

CPR400.1.1.19/[GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan.*

SNL, EP401502, *Procedure For Control of Environment, Safety and Health (ES&H) Documents.*

SNL, [GN470098](#), *Developing ES&H Procedures.*

SNL, [MN471000](#), *Pressure Safety Manual.*

SNL, [MN471011](#), *Sandia Explosives Safety Manual.*

SNL, [MN471016](#), *Radiological Protection Procedures Manual.*

SNL, OP471382, *Administrative Procedure for the Development of Safe Work Permits.*

Related Documents

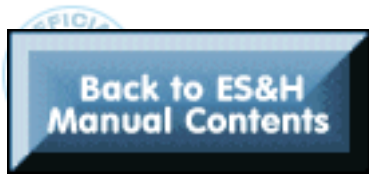
[DOE 5480.6](#), *Safety of DOE-Owned Nuclear Reactors.*

[DOE 5480.19](#), *Conduct of Operations Requirements for DOE Facilities.*

[DOE 5700.6C](#), *Quality Assurance.*

[DOE STD-1029-92](#), *Writers Guide for Technical Procedures.*

SNL, [CPR400.1.2](#), *Sandia National Laboratories Integrated Safety Management System Description.*



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Sandia National Laboratories

ENVIRONMENT, Safety & HEALTH

Manual

Current Changes

Administrative Changes Only December 21, 2006

Section 4G, "Fall Prevention/Fall Protection"

This section was revised to:

- Under the topic, "Performing Elevated Work on Roofs and Rolling Stock," after "Utilize the following when working on roofs":

- **Move:** text following the third bullet, "For fall hazard exposures 6' or less from an unprotected side..." up one level of subordination. Third bulleted item now reads: "For fall hazard exposures 6' or less from an unprotected side, edge, or hole on low sloped roofs (< 4/12 slope), MOW shall use guardrail systems, safety net systems, personal fall arrest systems, or some other method that will provide equivalent protection. For guidance, refer to Attachment 4G-5, "Fall Prevention/Fall Protection Decision Flowchart."
- **Move:** text following fifth bullet and combine it with text following fourth bullet.
- **Clarify:** the wording of Item 5 under "Work on unprotected low-sloped roofs shall be allowed without conventional fall protection under the following conditions." Item 5 now reads, "The trained 'Safety-monitor' must keep him/herself and other MOW within the designated safe work zone and greater than 15' from the edge."

December 15, 2006

Section 4V, "ES&H for Contracted Construction and Construction-Like Activities"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Greg Kirsch" **to** "Michael Strosinski."
- **Change:** The NM SME in the Direct Access Services (DAS) list under the heading "Construction-like activities" from "Greg Kirsch" to "Michael Strosinski" for the following subordinate contact listings:
 - Project Safety Plan
 - Worksite Compliance Checklist
- Under Attachment 4V-1, "ISMS Considerations for Work Plans":
 - ***Add:** Under the Work Plan Element "Work Performance," a new item titled "Pause Work" with the following related activity: "Pause work if the scope of work changes in such a way that new hazards are introduced; if this occurs, re-evaluate hazards and controls and document any additional controls that are required."
 - **Change:** The name of the last item listed under the Work Plan Element "Work Performance" **from** "Corrective Actions" **to** "Interim Controls and Notification."

Chapter 9, "Explosives Safety "

Note: (*) asterisk denotes substantive change.

This chapter was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Donald Joe" **to** "Roger W. Smith."
- **Add:** Tina Stetson and Ron O'Hara as contributors.
- Under the topic "Applicability":
 - **Change:** The last paragraph **from** "This chapter applies to all activities that involve explosives or energetic materials. This chapter does not apply to activities that use only household-type energetic materials, such as matches or gasoline" **to** "This chapter applies to all Members of the Workforce whose activities involve explosives or energetic materials. This chapter does not apply to the use of only household-type energetic materials, such as matches or gasoline."
- Under the topic "Explosives Operations":

- **Change:** The reference to the Sandia Explosives Safety Manual **from** “MN471011” **to** “CPR400.1.1.31/MN471011.”
- ***Delete:** The requirement “Members of the Workforce shall follow the explosives operations requirements stated in MN471018, *Conduct of Operations: Explosives Operations*, for activities where the amount of explosives involved meets or exceeds the threshold values stated in the document.” Note that this requirement has been deleted due to the fact that CPR400.1.1.33, MN471018, *Conduct of Operations Manual: Explosives Operations*, has been cancelled/archived and the requirements formerly contained in this CPR are now located in the ES&H Manual supplement, CPR400.1.1.31/MN471011, *Sandia Explosives Safety Manual*, Issue E, August 8, 2006.
- Under the topic “References”:
 - **Update:** The Requirement Source Document “DOE M 440.1-1” **to** “DOE M 440.1-1A” to reflect the current directive listed in Appendix G, “List of Applicable Directives and NNSA Policy Letters.”
 - **Change:** The reference to the Sandia Explosives Safety Manual under “Implementing Documents” **from** “MN471011, *Sandia Explosives Safety Manual*, for other specific requirements source citations” **to** “CPR400.1.1.31/MN471011, *Sandia Explosives Safety Manual*.”
 - **Delete:** The Related Document “MN471018, *Conduct of Operations: Explosives Operations*.”

Administrative Changes Only
December 15, 2006

Section 2D, "Perform Work "

This section was revised to:

- **Change:** The SME from “Johnny Vaughan” to “Nancy Linarez-Royce.”

- Under topic, “Safety Management Function”:

- Under subtopic, “Guidance”:

- **Add:** As the last sub-bullet describing processes, programs, and activities,

guidance that states, "Suspending work activities when new hazards or environmental risks are introduced."

- Under topic, "Administrative Duties":
- Under subtopic, "Guidance":
 - **Add:** A new paragraph providing guidance on when work should be paused, as follows: " When unanticipated hazards or environmental risks are introduced, work should be paused until revised work planning, hazard, and environmental impacts are analyzed; and any additional controls are documented and approved, as appropriate."



Administrative Changes Only December 13, 2006

Section 4E, "Hot Work Safety"

This section has been revised to:

- **Change** : The Subject Matter Expert (SME) **from** "Laura D. Draelos," **to** "Paul E. Giering."



Section 18B, "Safety Engineering Accident Investigation (AI) Process"

This section has been revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Don Joe," **to** "Ralph Fevig."

Under the DAS Listing for "Accident investigation":

- **Change:** The contact **from** "Don Joe," **to** "Ralph Fevig."

Administrative Changes Only December 8, 2006



Section 6F, "Commercial Underwater Diving"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** Jeffrey Downs **to** Patrick Murphy.
- In the Direct Access Services List, under the topic, "Underwater Diving":
 - **Change:** The Subject Matter Expert (SME) **from** Jeffrey Down **to** Patrick Murphy.

Section 6K, "Hazardous Waste Operations and Emergency Response (HAZWOPER)"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Linda Stiles," **to** "Steven W. Iveson."

Administrative Changes Only
December 6, 2006

Section 6C, "Respiratory Protection"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** Scott Stafford **to** Richard Lykins.

Administrative Changes Only
December 5, 2006

Section 6I, "Confined Space Entry "

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Scott W. Stafford" **to** "Paul E. Giering."

Section 6J, "Nonionizing Radiation"



This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** “Jeff Downs,” **to** “Mendy Brown.”

[Section 6R](#), "Indoor Air Quality"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** “Chad Hjorth” **to** “Steven W. Iveson.”

Administrative Changes Only December 4, 2006



[Section 6W](#), "Process Safety Management (PSM)"

This section has been revised to:

- **Add:** a Review Date to show that a self-assessment was done on this section.
- In the Direct Access Services List, under “Process Safety Management”:
 - **Add:** Mark Brynildson as the CA Counterpart.

December 1, 2006



[Section 6G](#), "Lasers and Intense Light "

Note: (*) Indicates a substantive change.

Note: Over 75% of this section is either new or has been substantively changed and should therefore be read in its entirety.

This section was revised to:

- ***Add:** The following terms to the glossary:
 - **Incidental Laser Personnel.**

- **Laser Managers.**
- **Laser Controlled Area.**
- **Maximum Permissible Exposure (MPE).**
- **Qualified Laser Operators.**
- **Nominal Hazard Zone (NHZ).**



**Administrative Changes Only
December 1, 2006**

Section 6H, "Noise Exposure and Hearing Conservation"

This section has been revised to:



- **Change:** The Subject Matter Expert (SME) **from** Matt Custer **to** Brad Lackey.
- In the Direct Access Services List, under "Noise Exposure and Hearing Conservation":
 - **Add:** Dan Kuey as the CA Counterpart.
 - **Change:** The Subject Matter Expert (SME) **from** Matt Custer **to** Brad Lackey.

**Administrative Changes Only
November 30, 2006**

Section 13B, "Hazards Analysis Process"

This section has been revised to:



- **Add:** A review date to the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed for this section.

Section 13C, "Authorization Basis Process"

This section has been revised to:

- **Add:** A review date to the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed for this section.

Section 13D, "Readiness Review Process - Planning, Review, and Approval"



This section has been revised to:

- **Change:** The review date to reflect the completion of the self-assessment and not the completion of the changes made as the result of the self-assessment. The official record of the completed self-assessment is maintained by the 10313 IMT group.

November 28, 2006

Section 4J, "Material Handling - Cranes, Hoists, and Forklifts"

Note: (*) asterisk denotes substantive change.

This section was revised to:



- Under topic, "Applicability":
 - **Change:** the sentence "For questions regarding hoisting and rigging, consult the cranes, hoists, and rigging program contact or the SNL Hoisting and Rigging Safety Committee web site" **to** "For questions regarding hoisting and rigging, consult the cranes, hoists, and rigging program contact or the SNL Material Handling website."
- Under topic, "Training and Qualifications":
 - **Change:** "The following table incorporates the training requirements of DOE-STD-1090-04, Chapter 6" **to** "The following table incorporates and meets the intent of the training requirements in DOE-STD-1090-04, Chapter 6."
- Under topic, "Training and Qualifications," in the Training table:
 - **Add:** "RGH201" to the "Recommended" columns for all categories of workers listed.
 - **Delete:** In the column "Work Activity or Role," for "Operators of Miscellaneous Lifting Devices," the two bulleted examples: "Self contained shop cranes and portable A frames" and "Truck mounted cranes with a capacity of 1 ton or less."
 - ***Move:** In the row for Operators of Miscellaneous Lifting Devices: "RGH137" from



the “Recommended” column to the “Required” column, and add “Refresher every three years.”

- **Delete:** In the “Required” column for “Operators of Miscellaneous Lifting Devices”: the following text: “Operators of self-contained shop cranes and portable A frames shall be familiar with, understand, and follow the operating instructions provided by the equipment manufacturer;” “Operator’s physical qualifications shall be based on specific job requirements;” “Operators shall be required by their employer to pass a practical operating skill evaluation. Qualification shall be limited to the type of equipment for which the operator is being evaluated.”
- **Add:** “RGH137” to the “Recommended” column for “Members of the Workforce who supervise crane, hoist, or forklift operators.”
- ***Add:** to the “Required” column for SNL mobile crane operators in New Mexico, after “Refresher Training”: “Comply with NM HOSA which includes alternative qualifications through NCCCO (National Commission for the Certification of Crane Operators).”
- ***Add:** to the “Required” column for Rigging Inspections: the words “or acceptable equivalent” after “RGH134.”
- ***Add:** to the “Required” column for Crane and Hoist Inspectors/Maintenance Personnel: “The providers of outside training resources are responsible for the training content and compliance with DOE STD 1090.2004, Chapter 6, and applicable OSHA regulations and ANSI standards.”
- **Add:** “RGH137” to the “Recommended” column for Sandia SMEs.
- **Delete:** In the “Recommended” column for Sandia SMEs: the phrase “Any supplier” before “Mobile Crane Inspector Training.”
- Under topic, “Training and Qualifications,” under subtopic, “Qualifications,” under “Requirements”:
 - ***Add:** After “Successfully complete an SNL-provided MCO ‘in-house’ training course,” the phrase “(good for one year).”
 - ***Add:** After “In addition to the DOE-STD-1090-04 requirements,” the following note: “The ‘In-House’ exemption can be used once and is good for one year. At the end of that year, employees must obtain a NM crane operator’s license. NM HOSA has specific criteria for obtaining a license (500 seat-time hours, taking a written and practical exam). For operators who cannot qualify for the mobile crane operator

license because of 'seat-time' issues, SNL/NM will provide mobile crane operators the opportunity to attend and qualify under the NM HOSA by passing the mobile crane operators certification provided by NCCCO certification. Our crane training contractor, Industrial Training International, Inc., can provide this qualification.”

- ***Delete:** After “In addition to the DOE-STD-1090-04 requirements,” after the item, “Pass an annual Department of Transportation (DOT) drug screen and physical exam,” the sentence, “To continue to be exempt, SNL employees who operate mobile cranes of 2 or more tons in capacity shall take a refresher course every 2 years.”



- Under topic, “Inspections and Maintenance”:

- ***Add:** the requirements for miscellaneous lifting equipment under “Equipment owners or operators shall request or perform inspections and maintenance as necessary for”: to the requirements for cranes/hoists, combining the two sets of requirements. The first bullet now reads, “Cranes, hoists, and miscellaneous lifting equipment (performed by the Technical Services Team for initial and periodic inspections, load tests, repairs, modifications, and preventive maintenance).”

- Under topic, “Procurement of Material-Handling Equipment”:

- ***Add:** under “Requirements”: “Members of the Workforce shall: Order only lifting devices or rigging equipment that meet DOE, OSHA, and ANSI standards.”
- ***Delete:** under “Requirements,” for Cranes/Hoists, the fifth bullet: “Suggest ordering all lifting devices to meet DOE, OSHA and ANSI standards.”
- **Change:** Under “Guidance”: “Equipment owners, when ordering slings and other rigging equipment, should ask the manufacturer to supply a certificate of proof testing and maintain a copy of it in an equipment history file for the life of the device” **to** “Equipment owners, when ordering slings and other rigging equipment, should ask the manufacturer to perform a proof test and supply a certificate of proof testing. Equipment owners should maintain a copy of the certificate in an equipment history file for the life of the device.”



- Under topic, “Recordkeeping”:

- ***Change:** Under “Requirements,” “Managers shall be responsible for maintaining SNL-specific records for crane, hoist, rigging, and forklift operations as summarized in the following charts” **to** “Managers shall be responsible for maintaining SNL-specific records for crane, hoist, rigging, and forklift operations as required by the Sandia Records Retention and Disposition Schedule.”



- ***Delete:** Under “Requirements”: the table showing records retention requirements.
- **Delete:** the subtopic ”Guidance” and the text under it: “Department managers/team supervisors are encouraged to maintain copies of approved purchase requisitions and manufacturer's manuals in department files for the life of the equipment.”
- Under topic, “Construction Hoisting and Rigging Equipment,” under “Requirements”:
 - ***Add:** “Note: At SNL/NM, this section (4J) does **not** apply to the procurement and management of construction or construction-like activities acquired from private contractors or suppliers. See Section 4V, ‘ES&H for Contracted Construction and Construction-Like Activities.’”
- Under topic, “Program Revision Guidance”:
 - ***Change:** The word “Guidance” **to** the word “Requirements” and make “Requirements” a sub-heading.
 - ***Change:** “SNL Program SMEs should make program revisions based on...” **to** SNL Program SMEs shall make program revisions based on.. .”
- Under topic, “References”:
 - ***Add:** to “Requirements Source Documents”:
 - 8 CCR § 5006, *Crane and Hoisting Equipment Operators – Qualifications*
 - *New Mexico Hoisting Operators Safety Act (HOSA), 60-15-1 NMSA 1978 et seq.*
 - **Add:** to “Implementing Documents”:
 - SNL, 400.2.20, “Management of Information throughout its Life Cycle.”
 - SNL, *Sandia Records Retention and Disposition Schedule.*
 - **Add:** to “Related Documents”:
 - 10 CFR 830, “Nuclear Safety Management.”
 - DOE O 414.1C, “Quality Assurance.”
 - SNL, CPR001.3.2, “Corporate Quality Assurance Program.”





- SNL, CPR500.2.1, “Procurement Manual.”
 - SNL, “Design Guide 10220: Handling Gear” (1999).
 - SNL, “Design Guide 10221: Lifting Gear” (1998).
 - SNL, *ES&H Manual*, Section 4V, “ES&H for Contracted Construction and Construction-Like Activities.”
- **Change:** in “Related Documents: “ANSI/ASME B56.1-2004, Safety Standard for Low-Lift and High-Lift Trucks” **to** “ANSI/ITSDF B56.1-2005, Safety Standard for Low and High-Lift Trucks.”
 - **Move:** From “Related Documents” to “Implementing Documents”:



- SNL, CPR500.2.1, Procurement Manual, "Special Approvals and Notification Copies."
- SNL, The Facilities Development Center Design Manual.

- In Attachment 4J-2, “Critical Lift Plan”:

- **Add:** Under “Perform Work,” after “The TWD must be modified and the Integrated Safety Management System (ISMS) process started over whenever there are any changes”: “(e.g., changes to the load configuration, load, placement, rigging, lifting scheme, or calculations.)”

- In Attachment 4J-3, “Examples of Suspended Load Hazards”:

- ***Change:** “If any of your employees are exposed to or have potential exposure to the ‘Suspended Load’ hazard...” **to** “If any Members of the Workforce are exposed to or have potential exposure to the ‘Suspended Load’ hazard...”



- In Attachment 4J-4, “List Of Currently Recognized Overhead Rigging Equipment Manufacturers”:

- **Add:** “Yoke Industrial Corporation: Hooks, master links, chain slings, shackles” with corporate logo and link to the company website

Administrative Changes Only
November 20, 2006

Section 4C, "Lockout/Tagout (LOTO)"

This section has been revised to:

- In the Table of Contents, under “Roles and Responsibilities”:
 - **Add:** links to the two subtopics under “Roles and Responsibilities”: “Management,” and “Members of the Workforce – Training.”
- Under the topic “Roles and Responsibilities,” under the subtopic “Management”:
 - **Add :** a note after “Management shall ensure that...a self-assessment is performed in accordance with Section 22A, “ES&H Self-Assessments”: “The optional ‘Lockout/Tagout Self-Assessment Tool’ is provided to assist with any LOTO self-assessments.”
- Under the topic “Roles and Responsibilities,” under the subtopic “Members of the Workforce – Training”:
 - **Add :** a note after “Members of the Workforce who are authorized workers shall complete the following training...LTO220, LOTO Annual Roles and Responsibilities (at least once per year)”: “Instructions for completing the training are provided in the TEDS training description; there is also an optional documentation tool for LTO220.”
- Under the topic, “Procedures”:
 - **Add :** “The following optional tools are provided to aid in the completion of the LOTO Procedures:
 - LOTO Checklist – provides a checklist to ensure that the steps below are completed.
 - Equipment-Specific LOTO Procedure – this optional template provides aids to identify the scope of the work, assess the hazards, identify LOTO points, authorized workers, and other useful items. Includes a portion of the Basic LOTO Checklist.”
- Under the topic, “Procedures,” under the subtopic “Periodic Inspections of Energy Control Procedure”:
 - **Add:** “An optional Tool for Performing Periodic Inspections is available for

documenting the periodic inspections described in this section. It provides written documentation that all requirements contained in this section are met, and identifies those workers authorized to perform LOTO in a specific energy control procedure.”



- Under the topic, “Procedures,” under the subtopic “Written LOTO Procedure”:
 - **Add:** “While the written LOTO procedure may take any form (e.g., a Technical Work Document (TWD) or Electrical Work Permit), the optional Equipment-Specific LOTO Procedure (ESLP) template is provided to help develop the procedure. The ESLP template includes instructions for use. The ESLP template is suitable for use any time LOTO is applied.”
- In Attachment 4C-1, “LOTO Catalog,” in the first table:
 - **Change:** The SNL/NM contact from “Steve Walcott, MS 1037, 844-6890” to “Mark Warner, MS1093, 284-6070.”
- In the Direct Access Services List, under “Lockout/Tagout”: delete “Steve Walcott (NM).”



November 15 , 2006

Section 2C, "Control Hazards"

Note: (*) Indicates a substantive change.

This section has been revised to:

- **Change:** The Subject Matter Expert (SME) from “Johnny Vaughan” to “Nancy Linarez-Royce.”
- **Change:** The CA Counterpart from “Donn Wright” to “Herman Armijo.”
- Under topic, “Control Measures”:



- Under subtopic, "Guidance":
 - **Add:** Guidance that states, “Eliminate the hazard; if not possible, use controls to prevent or mitigate.”
 - **Add:** Additional guidance that states, “Effective interim protective measures and hazard controls are implemented until permanent controls and final

abatement actions are in place or completed. See Section 13A, "Hazards Identification and Classification Process."

- **Delete:** The heading "Flow-down of Programmatic and Operational Requirements," and the guidance underneath.

- Under subtopic, "Training and Qualifications":

- ***Change:** The requirement for managers to "Prohibit Members of the Workforce under their direction from participating in any Sandia activities unless they are properly trained and qualified or adequately escorted."

to:

- "Prohibit MOWs from participating in any Sandia activities unless they are properly trained and qualified. Adequately escorted MOWs may be temporarily permitted on a case-by-case basis for either activity observation or mentoring (e.g., On-the-Job Training [OJT])."
- ***Add:** A note that states, "Untrained MOW may temporarily work under the direct supervision of an appropriately qualified MOW. See Chapter 11, 'ES&H Training,' for additional information."
- **Add:** To the guidance for MOWs and managers to "see Chapter 11, 'ES&H Training' for more details," about, "Establishing an OJT Program."

- Under topic, "Administrative Controls":

- Under subtopic, "Control Signs":

- **Change:** The reference in Guidance from, "[Section 4C](#), "Lockout/Tagout and Administrative Control Locking", **to** "[CPR400.1.1.7/GN470037](#) , *Administrative Control Procedure.*"

- Under subtopic, "Control Locking":

- **Change:** Guidance from, "Members of the Workforce should see Section 4C, "Lockout/Tagout and Administrative Control Locking," Attachment 4C-1, "SNL Lockout/Tagout (LOTO) Stand-Down Reauthorization Process," and [CPR400.1.1.7/GN470037](#), *Lockout/Tagout Procedure. for the Control of Hazardous Energy*, for information on control locking." **to** "Members of the Workforce should see Section 4C, "Lockout/Tagout" and [CPR400.1.1.7/GN470037](#), *Administrative Control Procedure.*"

- Under topic, “References”:
 - Under subtopic, "Requirements Source Documents":
 - **Update:** The title of reference DE-AC04-94AL85000 from "M&O Contract Between Sandia Corporation and DOE" to “M&O Operating Contract Between Sandia Corporation and DOE.”
 - Under subtopic, “Implementing Documents”:
 - **Delete:** CPR400.1.2.2, Process for Flow-Down and Tailoring of Requirements and Standards That Support Sandia's ISMS.



**Administrative Changes only
November 14, 2006**

Section 6Z, "Chronic Beryllium Disease Prevention Program "

This section was revised to:

- **Change:** The Subject Matter Expert (SME) from “Lisa Z. Hooper” to “Chad Hjorth.”
- **Change:** The NM SME in the Direct Access Services (DAS) list under the heading “Beryllium” from “Lisa Hooper” to “Chad Hjorth.”



Section 22A, "ES&H Line Self-Assessment (SA) Activities"

This section was revised to:

- Under topic, “Roles and Responsibilities”:
 - **Delete:** The responsibility for **executive management** to document performance goals in the scorecard. The scorecard process does not exist. It was an initial piece of the updated SA process but was never implemented.
 - **Delete:** The responsibility for **senior managers** to document performance goals in the scorecard. The scorecard process does not exist. It was an initial piece of the updated SA process but was never implemented.




- **Delete:** The responsibility for **managers** to document performance goals in the scorecard. The scorecard process does not exist. It was an initial piece of the updated SA process but was never implemented.
-

**Administrative Changes only
November 10, 2006**

Section 6L, "Eating and Drinking"

This section was revised to:


- 
- **Change:** The Subject Matter Expert (SME) **from** “Mendy Brown” **to** “Michael Roth.”
 - **Add:** A review date to the header to indicate that an ES&H Manual Self- Assessment (SA) checklist was completed on this section.
-

November 9, 2006

Section 4K, "Traffic Safety"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- 
- **Add:** A review date to the header to indicate that an ES&H Manual Self Assessment (SA) checklist was completed on this section.
 - Under topic, “General Traffic Rules”:
 - ***Add:** The following “Purpose” statement: “To ensure traffic safety at Sandia National Laboratories (SNL) by providing general traffic rules and guidelines for vehicles, motorized equipment, powered carts, bicycles, and pedestrians.”
 - ***Change:** The requirement **from**, “Always wear seat belts” **to** “Wear seat belts, whether a driver operating motorized or electric vehicles or a passenger in motorized or electric vehicles.”
 - ***Add:** The requirement, “Observe all traffic control signs and devices.”



- ***Add:** The requirement, “Report ES&H problems, concerns, or suggestions for improvement.”
- **Change:** The 377th Air Force Material Command **to** KAFB security police.
- **Change:** In the **Note**, “Members of the workforce” **to** “Emergency or security MOWs.”
- ***Add:** The heading, “Parking of Government and Construction Contractor Vehicles” and the following requirements:

MOWs who operate government vehicles shall:

- Park in designated government vehicle parking spaces when available. If designated government vehicle parking areas are full or no spaces are available, parking is permitted in non-designated, full-sized vehicle parking spaces. If additional parking spaces for government vehicle are needed contact Telecon.
 - For SNL/CA, contact Facilities Engineering.
- **Not** use government vehicles to reserve open vehicle parking spaces overnight. Park government vehicles only in designated government vehicle parking spaces overnight.
- **Not** back into diagonal parking stalls.

Contractors operating company vehicles may use open parking spaces on a daily basis, however, shall:

- **Not** use the company vehicle to reserve parking spaces overnight.

● Under topic, “Vehicles and Motorized Equipment”:

- ***Add:** The requirement, “Reduce speed when approaching a pedestrian within any marked or unmarked crosswalk and take any other actions to ensure the safety of pedestrians.”
- **Add:** The statement, “Motorized equipment may also use flashers to indicate speeds less than the posted limit” to the fifth bullet.
- ***Add:** The requirement, “Allow a distance of no less than 5 feet when passing bicyclists.”





- ***Add:** The requirement, “Not use cellular telephones while driving on KAFB unless a hands-free device is used. MOWs who do not own such a device shall pull over and park the vehicle prior to using a cell phone.”
- ***Add:** The requirement, “Not use cellular phones in and near (about 50 feet from) base gates.”
- ***Add:** The requirement, “Not smoke while operating government vehicles or motorized equipment.”

- Under topic, “Powered Carts”:

- ***Change:** The requirement **from**, “Managers to whom carts are assigned shall ensure that all MOWs who operate carts are familiar with the cart's operating procedures, restrictions, and limitations” **to** “Managers to whom carts are assigned shall ensure that all MOWs who operate carts have read and understand the cart's operating procedures, restrictions, and limitations.”



- Under topic, “Motorcycles”:

- ***Change:** The first requirement from "Complete KAFB's safety course IV-A or IV-B" **to** "Complete KAFB's safety course IV-A or IV-B or equivalent. "
- **Add:** The note, “Equivalent courses can be taken through the City of Albuquerque. For details, contact any motorcycle dealership in Albuquerque.”
- ***Add:** Under “Complete KAFB’s safety course IV-A or IV-B or equivalent” the following bullet statement: “For SNL/CA, follow applicable requirements as defined in the California Vehicle Code.”
- ***Change:** The requirement **from**, “Wear clearly visible protective clothing and equipment during operation, such as brightly colored or contrasting vest or jacket...” **to** “Wear an upper garment containing a minimum of 144 square inches of one of the following authorized bright/contrasting colors: International Orange, International Red, International Yellow, etc. The garment must be reflective for use during hours of darkness and limited visibility. This garment must be worn as the outermost layer of clothing. If in doubt, personnel may contact the 377 ABW Ground Safety Office to schedule an inspection of their upper garments to ensure they meet all requirements.”
- ***Add:** Under “Wear an upper garment containing a minimum of 144 square ...” the following bullet statement: “For SNL/CA, follow applicable requirements as defined



in the California Vehicle Code.”

- ***Change:** The requirement **from**, “Ensure that the helmet type has been approved by the Department of Transportation, the SMF, American National Standards Institute (ANSI), the Vehicle Safety Commission, or the Safety Helmet Council of America” **to** “Ensure that the helmet type meets the standards of either the American Society for Testing and Materials (ASTM) or the United States Consumer Product Safety Commission (CPSC) and has been approved by the Department of Transportation, the SMF, American National Standards Institute (ANSI), the Vehicle Safety Commission, or the Safety Helmet Council of America.”
- ***Change:** The requirement **from**, “Wear shoes or boots, full leg covering, impact-resistant goggles or a full-face shield, and full-fingered gloves” **to** “Wear sturdy footwear, full leg covering, impact-resistant goggles or a full-face shield, and full-fingered gloves.”
- **Move:** The statement, “Park in designated motorcycle parking areas” **from** 2nd level bullets **to** 1st level bullets.
- **Add:** Under “Park in designated motorcycle parking areas,” the statement: “SNL/ CA – Motorcycles can park in any available vehicle stall or location as long as the normal flow of vehicular and pedestrian traffic is not impeded.”
- ***Delete:** The requirement, “Park in designated or crosshatched areas.”
- ***Change:** The requirement **from** “Park on lawns or adjacent to buildings” **to** “Park on lawns, walkways, or adjacent to buildings.”
- ***Change:** Note 1 **from** “If parking areas are not available, parking is permitted in full-sized vehicle parking spaces only” **to** “If designated motorcycle parking areas are full or no spaces are available, parking is permitted in non-designated, full-sized vehicle parking spaces. If additional motorcycle parking is needed contact Telecon.”
- ***Add:** The topic, “Mopeds” and the following note and requirements:

Note: The following requirements apply to SNL/NM only.

Mopeds may be ridden as bicycles while inside the technical areas (streets only) of Sandia. MOWs and visitors who operate a moped on KAFB and Sandia-controlled premises shall:

- Park mopeds in areas designated for bicycles.

- Disengage the motor and propel the moped by human power when operating on a designated bicycle path.
- Give an audible signal (horn, bell, or voice) when overtaking a pedestrian.
- **Not** allow passengers.
- **Not** park on sidewalks, lawn, or other grassed areas, or adjacent to or against buildings.



- Under topic, "Skating":
 - ***Add:** The following note, "The following requirements and guidance applies to SNL/NM only."
 - ***Add:** The requirement, "Give an audible signal (horn, bell, or voice) when overtaking a pedestrian."
 - ***Change:** The requirement **from**, "During hours of high vehicle traffic or any time that the use interferes with vehicle traffic" **to** "During hours of high vehicle and pedestrian traffic."

- Under topic, "Bicycles":



- ***Change:** In 2nd bullet under "Requirements," the end of the sentence **from** "unless otherwise noted" **to** "unless otherwise posted."
- ***Change:** The requirement **from**, "Observe all vehicle signs except when dismounted, at which time, obey pedestrian rules" **to** "Observe all posted signs, devices, markings, and patterns (including traffic-related signs in construction zones)."
- **Move:** The requirement, "Dismount and walk the bicycle through a pedestrian gate when entering or leaving a technical area" **to** 1 st level bullet.
- ***Change:** The requirement **from**, "Operate in single file on the far right side of the roadway" **to** "Operate in single file on the far right side of the roadway in the designated bike lane or as far right as practical."
- ***Change:** The requirement **from**, "Wear a brightly colored or contrasting jersey, vest, or jacket as an outer garment during the day" **to** "Wear brightly colored jersey, vest, or jacket as an outer garment during the day; and a reflective jersey, vest, or jacket as an outer garment at night. The upper garment must contain a minimum of



144 square inches of one of the following authorized bright/contrasting colors: International Orange, International Red, International Yellow, etc. The garment must be reflective for use during hours of darkness and limited visibility. This garment must be worn as the outermost layer of clothing and cover backpacks if worn.”

- ***Add:** The requirement for SNL/CA, “Wear a brightly colored or contrasting jersey, vest or jacket as an outer garment during the day when riding outside technical areas.”

- **Change:** The requirement **from**, “MOWs and visitors shall not cross the centerline of the roadway” **to** “MOWs and visitors shall not ride against the flow of traffic.”

- ***Add:** The requirement, “SNL/CA – Packages, articles, etc. shall be placed in a basket for transporting or another means of transportation shall be obtained.”

- **Add:** The statement “in motion” to the end of the requirement, “Attach themselves, their bicycle, coaster, roller skates, skateboard, sled, scooter, or toy vehicle to another motor vehicle.”

- ***Change:** The note **from**, “Bicyclists may ride on sidewalks on KAFB unless otherwise prohibited” **to** “Bicyclists may only ride on sidewalks on Wyoming Boulevard between F Avenue and the Wyoming gate.”

- **Delete:** Under “Guidance” the words, “all roadways and” from the 5 th bullet.

- **Delete:** Under “Guidance” the following two statements:

- Dismount and walk the bicycle through a pedestrian gate when entering or leaving a technical area.
- Wear reflective clothing or a vest when riding after dusk and before dawn.

- **Add:** Under “Guidance” the statement, “SNL/CA – Bicycle operations should not take place before dawn or after dusk. If such operations are necessary, reflective clothing should be worn.”

- Under topic, “Pedestrians”:

- ***Add:** The word “devices” to the requirement, “Follow all posted traffic signs, markings, and patterns (including traffic-related signs in construction zones).”

- ***Add:** The requirement, “Exercise caution when entering a crosswalk; make eye

contact with drivers when crossing streets or crosswalks, and avoid blindly stepping off curbs.”

- ***Add:** The requirement, “Yield the right of way to emergency and security response vehicles when an emergency or security response vehicle approaches from any direction using flashing lights and/or sirens.”
- ***Change:** The requirement **from**, “Not walk on the street where sidewalks are available” **to** “Not walk in the street when walkways or sidewalks are available.”
- ***Add:** The requirement, “Not walk in any landscaped areas.”

- Under topic, “Parking”:

- ***Change:** The requirement from, “Park only in designated parking areas” **to** “Park only in designated parking areas and display proper permits as applicable.”
- **Add:** The following note, “Designated parking is only allowed for Government, Visitor, Carpool/Vanpool, Loading/Unloading, Medical, Handicapped, Shift Parking, Protocol, Cart, Motorcycle, Patient, etc. Organizational /Department/ Building-specific parking is not permitted.”
- ***Add:** The following **shall not** requirements:
 - Near doorways of a building blocking easy egress for emergency situations. This requirement includes government vehicles.
 - Within 15 feet of building air intake systems.
 - Within any established construction zone.

- Under topic, “References”:

- ***Add:** The following references under “Requirements Source Documents.”
 - AFI 31-204, KAFB Supplement 1, 28 February 2005
 - CPR400.3.16, Cellular Phones

Section 10F, "Oil and Fuel Storage"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- Under the topic, “Applicability, Exemptions”:
 - ***Delete:** Hydraulic lift equipment.
- Under the topic, “Inspections”:
 - ***Change:** Conduct monthly inspections of all bulk oil-storage containers with a capacity of 55 gallons or greater and complete SF 2001-OIC, Oil Storage Facility Inspection Checklist ([Word file/Acrobat file](#)).

to:

- Conduct monthly inspections of all bulk oil-storage containers with a capacity of 55 gallons or greater.
 - Document the inspection with either the Storage Facility Inspection Checklist , SF 2001-OIC, ([Word file/Acrobat file](#)) or forms developed for their site specific operation with approval from the SPCC Coordinator.
- Under the topic, “Requirements Source Documents”:
 - **Update:** DOE 450.1, Environment, Safety, and Health Program for Department of Energy Operations.” to read "DOE O 450.1, Chg 1, Environmental Protection Program.”
- In Attachment 10F-1, “Special Requirements for Storage Tanks Regulated by the New Mexico Environment Department”:
 - ***Delete:** Under “Other Tasks,” “Implement their corrosion-prevention plan by July 1, 2006. **Note:** SNL/NM has submitted a corrosion-prevention plan to the NMED. Contact the SPCC Coordinator for additional information.”
 - **Clarify:** From “Have installed release-detection on all existing AST systems by August 15, 2004, and shall ensure that new AST systems have a method of release-detection upon installation.”

to:

- “Install release-detection on all new and existing AST systems.”

Administrative Changes Only November 6, 2006



Section 6T, "Asphyxiating Environments"

In Section 6T and Attachments 6T-1 and 6T-2:

- **Change:** the California Counterpart from Alan Buerer to Dan Kuey.

Section 13A, "Hazards Identification and Classification Process"

- **Change:** The revision date from October 2, 2006 to September 28, 2006, per dated signatures on the section Change Notice.



Chapter 15, "Emergency Preparedness and Management"

This chapter was revised to:

- Under the topic, "Implementing Documents":
 - **Delete:** "SNL, PN471004, *Emergency Preparedness Plan.*"

Administrative Changes Only November 2, 2006

Section 6P, "Local Exhaust Ventilation"



- Change: The California Counterpart from Alan Buerer to Dan Kuey.
- In the Direct Access Services List, under "Local Exhaust Ventilation": change the CA contact from Alan Buerer to Dan Kuey, and delete "Maintenance Engineering."

October 30, 2006

Section 4T, "Firearms Safety"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- ***Change:** Anywhere in Section 4T and attachments, wherever it's listed as a requirement: DOE STD 1091.96 **to** DOE M 470.4-3.
- **Replace:** Anywhere in Section 4T and attachments: the terms "Firearms Program SME" or "Firearms Safety Contact" with the term "Firearms SME."
- **Add:** Review Date to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- Under topic, "Applicability":
 - ***Add:** a reference to a DOE directive that provides requirements for use of firearms: DOE M 470.4-3.
 - **Change:** the wording in the "Note" under "Security Use of Firearms" to clarify the meaning of the Note and make it more concise.
 - **Change:** Under "Exemptions," in the first sentence: the word "entering" to "beginning."
 - **Change:** the wording in the "Note" under "Exemptions" to clarify the meaning of the Note and make it more concise.
 - ***Delete:** references to three DOE directives previously listed as requirements for use of firearms: DOE M 473.2-1A, DOE M 473.2-2, Change 1, and DOE N 471.3.
- Under topic, "Training":
 - **Add:** under "Recommended" for managers and supervisors: "National Rifle Association, Basic Firearm Training Course."
 - ***Add:** New row in Training table for "Armorer" under "Position or Activity," with the following text under "Required": "Must acquire and maintain DOE National Training Center (NTC) certified armorer's status and specific manufacturers' qualifications."
 - **Add:** under "Recommended" for Firearms Custodians: "National Rifle Association, Basic Firearm Training Course."

- ***Add:** New row in Training table for Firearms SME, with the following text under “Required”: “Basic Firearms Training: National Training Center, Basic Firearms Training (online course PFT-112) or National Rifle Association Basic Firearm Training course, Protective Force Safety Fundamentals SAF-250 (40 hr. course), SNL Firearms Management System training to include Oracle Training, Firearms Custodian, Administrator, FAP Firearms Authorized Personnel.”
- **Add:** Under “Recommended” for Firearms SME: “OJT: Assist in annual Firearms Appraisals (SNL/NM, SNL/CA, TTR, AK) conducted by members of SJFSC (Sandia Joint Firearms Safety Committee), Read and become familiar with *ES&H Manual* Section 4T and DOE O 440.1a, DOE M 470.4-3, 10 CFR 851, Observe ProForce Training (Square Range Shooting and Shoot House).”
- ***Change:** under “Required” for Firearms-Authorized Personnel: Change “Initial and refresher training provided by the SJFSC” to “NRA Basic Firearm Training Course (refresher training required every three years), or equivalent documented certification from a manufacturer or NTC course.”
- ***Delete:** under “Required” for managers and supervisors: “LMC 110 as required.”
- **Delete:** under “Recommended” for managers and supervisors: “Initial and refresher training provided by the SJFSC (refresher training available every three years).”
- ***Delete:** under “Required” for Firearms Custodians: “LMC 110 as required” and “Initial and refresher training provided by the SJFSC (refresher training required every three years).”
- ***Delete:** under “Required” for Firearms-Authorized Personnel: “LMC 110 as required.”

- Under topic, “General Firearms Safety”:

- ***Add:** under “Requirements,” for managers of organizations utilizing firearms or munitions, the following text:

“Ensure that a Firearms Safety Plan is developed and approved by SNL and DOE/SSO before beginning any firearms-related activity. This is in addition to existing PHSs or HAs (see Safety and Risk Analysis below). The plan must follow ISMS and include provisions for a pre-job safety meeting before any firearms manipulation.

At SNLNM and CA, firearm-related ES&H SOPs shall be developed and approved according to, Chapter 21, ‘Technical Work Documents (TWDs).’ Assure that an

independent assessment of internal operations is performed annually. Assess all operations involving firearms or munitions and ensure that associated risks are acceptable and consistent with training and operational requirements. Develop CAPs (corrective action plans) to address issues found and close out on a timely basis.”

- ***Add:** under “Requirements” for armorers or custodians, the following text: “Obtain and maintain training necessary to meet their responsibilities as an armorer or custodian. (Armorers must obtain and maintain certifications by National Training Center [NTC] or firearm manufacturer).”
- ***Add:** new requirement for Firearms SME: Maintain firearms expertise by attending required firearms training.
- **Change:** Under “Requirements” for “Managers of organizations utilizing firearms or munitions” the wording of the first two general firearms safety rules from: 1. “All firearms are considered loaded at all times” **to** “All firearms are always loaded,” and 2. “Never let the muzzle cover anything you are not willing to destroy” **to** “Never point a firearm at anything you are not willing to destroy.”

- Under topic, “Reporting”:

- **Add:** to the third bullet in the column headed “Circumstance,” “after “Unauthorized Discharge (UD) of Firearms,” the following text: “(defined in DOE M 470.4-7 as “the discharge of a firearm under circumstances other than (1.) during firearms training with the firearm properly pointed down range (or toward a target) or (2.) the intentional firing at a hostile party when deadly force is authorized by 10 CFR 1047.7.”)”

***Change:** “Report immediately to a manager, supervisor, range officer, or controller and the committee chair of the SJFSC” **to** “ Report immediately to one of the following:

Manager,

Supervisor, or

Range officer.”

- **Change:** “See [Section 18C](#), “Occurrence Reporting,” for additional requirements or [Attachment 4T-2](#), “Checklist for Unauthorized Discharges (UDs),” as appropriate.” **to** “Follow the requirements of [Section 18C](#), “Occurrence Reporting,” and (if applicable) [Attachment 4T-2](#), “Checklist for Unauthorized Discharges (UDs).”

- Under topic, “Safety and Risk Analysis”:
 - ***Change:** Under “Requirements,” the following text: “Managers shall be responsible for ensuring that: A safety analysis, safety assessment, or risk analysis for all facilities, operations, and activities involving the use, transportation, or storage of firearms or related munitions is performed. The type and depth of analysis depend on the level of hazards present (consult with the firearms safety contact or the appropriate Division ES&H Team for assistance with such determinations)” **to:** “Managers shall be responsible for ensuring that: A Firearms Safety Plan that includes a safety analysis, safety assessment, or risk analysis for all facilities, operations, and activities involving the use, transportation, or storage of firearms or related munitions is developed. The type and depth of analysis depend on the level of hazards present (consult with the firearms safety contact or the appropriate Division ES&H Team for assistance with such determinations). The Firearms Safety Plan is needed even when a PHS and HA already exists.”
 - ***Change:** Under “Requirements”: the following text: “Managers shall be responsible for ensuring that: Analysis reports are submitted to the firearms safety contact for approval before implementing any new firearms or munitions operations, training, or activities” **to** “Managers shall be responsible for ensuring that: Firearms Safety Plan and analysis reports are submitted to the DOE-SSO and SNL firearms SME for approval before implementing any new firearms or munitions operations, training, or activities.”
- Under topic, “Personal Protective Equipment”:
 - ***Change:** Under “Requirements,” the following text: “Eye protection that meets ANSI Z87.1-1989, *Practice for Occupational and Educational Eye and Face Protection*” **to** “Eye protection (see ANSI Z87.1-2003, *Occupational and Educational Eye and Face Protection*).”
 - ***Change:** Under “Requirements,” the following text: “Hearing protection, as appropriate, with a minimum noise reduction rating (NRR) of 26” **to** “Hearing protection: dual hearing protection (ear muffs and ear plugs) is required for certain activities. (See SNL Operating Procedure, ‘Protective Force Program: Impact and Impulse Noise Implementation Guidelines, SNL/NM Hearing Conservation Program.’ Also see Section 6H, ‘Noise Exposure and Hearing Conservation’).”
- Under topic, “Exposure to Hazardous Material and Environments”:
 - **Add:** In Note after “See Section 6H, ‘Noise Exposure and Hearing Conservation,’ for additional information”: “Also see SNL Operating Procedure, “Protective Force



Program: Impact and Impulse Noise Implementation Guidelines, SNL/NM Hearing Conservation Program.”

- Under topic, “Influence of Drugs and Alcohol”:
 - ***Change:** Under “Requirements” the following text: “Ensure that supervisors and FAP receive training on how to identify individuals who may be under the influence of drugs, alcohol, or medications, and display other forms of aberrant behavior as required by Sandia” **to** “Ensure that supervisors and FAP receive Sandia-required training on how to identify individuals who may be under the influence of drugs, alcohol, or medications, and display other forms of aberrant behavior.”
- Under topic, “Storage and Transportation of Firearms and Munitions,” under “Requirements”:
 - ***Add:** at the end the first bulleted item, “Site-specific plans or procedures for the safe storage of firearms and munitions are developed and comply with the requirements in CPR400.1.1.31/MN471011, *Sandia Explosives Safety Manual*, and DOE M 470.4-3, *Protective Force*” the sentence, “This information shall be included in the Firearms Safety Plan.”
 - **Change:** the bulleted item, “Firearms, ammunition, pyrotechnics, and explosives are stored in GSA-approved firearms storage containers or containers approved by the SJFSC (for non-Pro Force firearm use only) that are bolted or otherwise secured to the structure or under alarm coverage” **to** “Firearms, ammunition, pyrotechnics, and explosives are stored in GSA-approved firearms storage containers or containers approved by the SJFSC that are bolted or otherwise secured to the structure or under alarm coverage.”
 - **Change:** the bulleted item beginning “Firearms not in such containers...” to make it a “Note” to the preceding bulleted item.
 - **Change:** in the Note under “Authorized Storage Facilities”: “A list of authorized storage facilities may be obtained from the firearms safety contact or the Industrial Hygiene & Safety Programs manager” **to** “A list of authorized storage facilities may be obtained from the firearms SME or the Safety Engineering manager.”
 - **Change:** Under “Onsite Transportation”: the bulleted item, “Ammunition is segregated from firearms during transportation; in the original or metal ammunition containers” **to** “Ammunition is segregated from firearms during transportation and kept in the original or metal ammunition containers.”
- Under topic, “References”:

○ ***Add:** to “Requirements Source Documents”:

- 10 CFR 851, “*Worker Safety and Health Program*”
- DOE M 440.1-1A, “*DOE Explosives Safety Manual*”
- DOE M 470.4-3, “*Protective Force*”
- DOE O 470.4, “*Safeguards and Security Program*”
- SNL, CPR001.1, *Corporate Business Rules System Standard*, Section 3.7, “Exceptions to Corporate Business Rules.”
- SNL, CPR400.1.1, *ES&H Manual*, Section 4L, “Personal Protective Equipment (PPE)”
- SNL, CPR400.1.1, *ES&H Manual*, Section 6H, “Noise Exposure and Hearing Conservation.”
- SNL, CPR400.1.1, *ES&H Manual*, Chapter 13, “Hazards Identification/ Analysis and Risk Management.”
- SNL, CPR400.1.1, *ES&H Manual*, Chapter 15, “Emergency Preparedness and Management.”
- SNL, CPR400.1.1, *ES&H Manual*, Chapter 16, “Health, Benefits, and Employee Services.”
- SNL, CPR400.1.1, *ES&H Manual*, Section 18C, “Occurrence Reporting.”
- SNL, CPR400.1.1, *ES&H Manual*, Section 19A, “Hazardous Waste Management.”
- SNL, CPR400.1.1, *ES&H Manual*, Chapter 21, “Technical Work Documents”
- SNL, CPR400.1.1.19/GN470086, “*SNL Bloodborne Pathogens Exposure Control Plan.*”
- SNL, CPR400.1.1.40/GN470104, “*Firearms Management.*”

○ **Add:** to “Implementing Documents”:

- DOE M 470.4-7, “*Safeguards and Security Program References.*”

- SNL, Operating Procedure, “Protective Force Program: Impact and Impulse Noise Implementation Guidelines, SNL/NM Hearing Conservation Program.”
- SNL, CPR400.1.1, *ES&H Manual*, Section 22B, “Root Cause Analysis.”
- SNL, [Firearms Management System website](#).

○ **Add:** to “Related Documents”:

- ANSI Z136.6-2005, “*Safe Use of Lasers Outdoors*.”

○ ***Delete:** from “Requirements Source Documents”:

- Under “29 CFR 1910” the references to Subsection 95, Subsection 1025, and Subsection 1200.
- DOE N 471.3, “*Reporting Incidents of Security Concern*.”

○ **Delete:** from “Related Documents”:

- OSHA 3074, “*Hearing Conservation*.”

○ ***Move:** from “Requirements Source Documents” to “Implementing Documents”:

- DOE STD 1091-96, “*Firearms Safety*.”

○ ***Move:** from “Implementing Documents” to “Requirements Source Documents”:

- SNL, CPR400.1.1.31/MN471011, “*Explosives Safety Manual*.”
- SNL, CPR400.3.15, “*Locks and Keys*.”

● In Attachment 4T-1:

○ ***Add:** Under the heading “Action Plan,” the following bulleted items:

- “Document and number the corrective action plans in SJFSC action items file.”
- “Track the status of each corrective action to completion.”
- “Note in minutes and in SJFSC CAP tracking that corrective action has been completed.”

- ***Change:** Under the heading “Appraisal Report”: “A draft of the appraisal report and submit it to the appraised organization for review within 10 working days of the conclusion of the appraisal; The final appraisal report and transmit it to the appraised organization within 30 calendar days of the close-out meeting; The appraised organization shall review the draft report and submit comments to the appraisal team within 10 working days of draft receipt” **to** “A draft of the appraisal report and submit it to the appraised organization for review within 30 working days of the conclusion of the appraisal; The final appraisal report and transmit it to the appraised organization within 60 calendar days of the close-out meeting; The appraised organization shall review the draft report and submit comments to the appraisal team within 15 working days of draft receipt.”

- ***Change:** Under the heading “Action Plan”: the following bulleted items:
 - “Perform a root cause analysis on all findings listed in the appraisal report” to “Perform a root cause analysis (as appropriate) on all findings listed in the appraisal report.”
 - “Transmit, via the team leader, the action plan to the appraisal team within 30 calendar days of the close-out meeting” **to** “Input and transmit, via the team leader, the action plan into the DRATs/ESHER tracking system to the appropriate line organization within 30 calendar days of the close-out meeting.”

- ***Delete:** the following bulleted items:
 - “Complete the planned corrective actions and track the status of each.”
 - “Submit an updated action plan to the appraisal team for approval if a planned action or a completion date changes due to resolutions or implementation conflicts, etc.”
 - “Submit a completion certificate to the appraisal team upon completion of all corrective actions.”

- In Attachment 4T-2:

- **Add:** after “Managers should use and become familiar with this checklist as a functional part of an unauthorized discharge” the following text: “(defined in DOE M 470.4-7 as ‘the discharge of a firearm under circumstances other than (1.) during firearms training with the firearm properly pointed down range (or toward a target) or (2.) the intentional firing at a hostile party when deadly force is authorized by 10

CFR 1047.7.}')”

- ***Change** (in “Action” column in checklist):
 - In Item 2: “Members of the Workforce involved in or witnessing a UD shall immediately report the incident to a supervisor and range officer, as appropriate” **to** “Members of the Workforce involved in or witnessing a UD shall immediately report to one of the following:
 - Manager,
 - Supervisor, or
 - Range officer.”
 - In Item 3: “The individual firing the UD and other involved parties shall immediately be removed from training...” **to** “ The individual firing the UD and other involved parties shall be immediately disarmed and removed from training...”
 - In Item 6: “Written statements shall be immediately obtained from all involved parties” **to** “Obtain written statements ASAP. Ask individuals not to discuss the event with others until written statements are obtained from all involved parties.”
 - In Item 12: “The recent working schedule of the person(s) involved in firing the UD, and other pertinent details that may have contributed shall be documented” **to** “Obtain the most recent working schedule of the person(s) involved in firing the UD, and other pertinent details.”
- In Attachment 4T-3:
 - **Change:** Under “Basic Rules of Safe Firearm Handling,” the following wording:
 - From “Never point a firearm at anything you are unwilling to destroy” **to** “not willing to destroy.”
 - From “Keep your finger off the trigger until you are ready to fire” **to** “Keep your finger off the trigger until your sights are on the target.”
 - From “Know your target” **to** “Be sure of your target.”
 - From “bullets in the chamber or the clip” **to** “live rounds in the chamber or the



magazine.”

- From “Never face or approach a police officer with a firearm in your hand. They will shoot you,” **to** “Never face or approach a security or civilian police officer with a firearm in your hand. They will respond appropriately to your actions.”
- From “Shooting through doors or at shadows and noises is a good way to hit an innocent person” **to** “Shooting through doors or at shadows and noises can result in the wounding or killing of an innocent person.”
- **Add:** Under “Additional Safety Rules”:
 - Under “Always Check the Load Condition of the Firearm”: “When in doubt, remember Rule 1: All firearms are always loaded.”
 - Under “Ensure the Firearm is Safe to Operate”: the phrase “periodic inspections and maintenance.”
- ***Change:** Under “Additional Safety Rules”:
 - Under “Wear Eye and Ear Protection”: “Members of the Workforce should always wear eye and ear protection during firearm use” **to** “Members of the Workforce shall always wear eye and ear protection during firearm use.”
 - Under “Know How to Handle Misfires, Hangfires, and Squib Rounds”: “It might simply be a bad round (the portion of the bullet that is projected from the cartridge)” **to** “the primer fails to ignite the gunpowder, resulting in a misfire.”

Administrative Changes Only October 24, 2006

Section 4P, "Housekeeping"

This section was revised to:

- **Change:** The Review Date in the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on October 23, 2006.



October 19, 2006

Section 4B, "Electrical Safety Practices "

Note: All of the electrical safety requirements in this section have been moved to CPR400.1.1.28/[MN471004](#), *Electrical Safety Manual*.

October 2, 2006

Section 4G, "Fall Prevention/Fall Protection"

Note:(*) asterisk denotes substantive change.

This section was revised to:



- **Change:** The Subject Matter Expert (SME) **from** Ernest Sanchez **to** Danny Donald on parent document and all associated documents and forms.
- **Add:** A review date to the header to indicate that an ES&H Manual Self Assessment (SA) checklist was completed on this supplement.
- **Change:** Section heading from , "Performing Elevated Work" to "Performing Elevated Work on Roofs and Rolling Stock."
- **Change:** Attachment 4G-1, title **from**, "Components of a Fall Protection System" **to** "Fall Protection Equipment and Components."
- ***Add:** the following Attachments:
 - 4G-2 - "Suspension Trauma/Orthostatic Intolerance"
 - 4G-3 - "Rolling Stock"
 - 4G-4 - "Service Life for Personal Fall Arrest Systems"
 - 4G-5 - "Fall Prevention/Fall Protection Decision Flowchart"
- **Change:** Form SF 2001-FPC, title **from**, "Fall Protection Checklist" **to** "Fall Protection Work Planning Checklist."



- ***Add:** Form SF 2001-FPE, "Fall Protection Equipment Checklist."




- Under topic, "Applicability":

- ***Add:** the statement, "This section applies to MOWs whose activities include an exposure to fall hazards at levels higher than 4 feet above ground or floor levels on Sandia-controlled premises."
- ***Add:** the note, "This height requirement may change due to local regulations, contact your line support Safety Engineer for clarification."
- **Add:** an exception statement, "The provisions of this section do not apply when MOWs are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of work activities or after all work activities have been completed. This exception to work activities does not give MOWs authority to perform work in an unsafe manner or jeopardize safety. Exercise extreme care and good judgment should at all times."

- Under topic, "Training":

- **Change:** Note to guidance that states, "Members of the Workforce who complete fall-prevention and fall-protection training should:
 - Plan their work.
 - Identify potential fall hazards associated with the work activity.
 - Control fall hazards using fall-prevention or fall-reduction equipment.
 - Select appropriate equipment for particular work environments.
 - Demonstrate proper fall-protection equipment inspection techniques.
 - Locate and use proper anchorage procedures.
 - Demonstrate donning, adjustment, and proper fit of a full-body harness (FBH).
 - Experience the need for proper adjustment of a FBH while being suspended.
 - Follow fall-protection procedures to minimize fall hazards."

- Under topic, "Fall-Prevention/Fall-Protection Procedures":

- 
- ***Add:** the requirement, “Managers shall be committed to the elimination of fall hazards and shall ensure MOWs not perform work if exposed to a fall hazard.”
 - ***Change:** the requirement **from**, "Work requiring the use of fall-protection equipment is covered by a written procedure, such as an “OP” **to** “A technical work document (TWD) shall cover all work requiring the use of fall prevention/fall protection procedures or equipment.”
 - ***Add:** the requirement, “Utilize the “Hierarchy of Fall Protection” in developing elevated work plans (TWDs)” and the following bullet points.
 - Eliminating fall hazards.
 - Preventing fall hazards by guarding.
 - Arresting falls (PPE).
 - Applying administrative techniques.
 - Training requirements.
 - Activity to be performed (**Not** perform work when exposed to a fall hazard).
 - Mobility required.
 - Workplace conditions.
 - Hazards that may be encountered during an activity.
 - Types of equipment required for each task performed at elevated levels.
 - Competent person reviews and makes equipment recommendations.
 - Limiting conditions that will require stopping work.”
 - ***Add:** the use of Self-rescue equipment to the rescue plan for the technical work document.
 - **Add:** note 1, “For information on orthostatic intolerance issues related to prolonged suspension in fall-protection equipment, refer to attachment 4G-2, “Suspension Trauma/Orthostatic Intolerance.”
 - **Add:** note 2, Refer to attachment 4G-1, “Fall Protection Equipment and
- 
- 

Components.”

- **Change:** the guidance statement **from**, “Managers and Members of the Workforce should, during the planning process, consider methods of avoiding exposure to fall hazards that include installation of permanent fall-prevention measures in the workplace” **to** “During the planning process, Managers and MOWs should consider all methods for avoiding/controlling exposure to fall hazards.”



● Under topic, “Performing Elevated Work on Roofs and Rolling Stock”:

- ***Change:** the requirements for “Working on Roofs” to:

Utilize the following when Working on Roofs:

- Get permission and gain access to a building’s roof by using the appropriate roof access process.
- Consider these additional concerns and health hazards while working on roofs: chemicals, magnetic fields, ionizing and non-ionizing radiation, skylights, weather, communication, etc.).

For fall hazard exposures 6’ or less from an unprotected side, edge, or hole on low sloped roofs (< 4/12 slope). (For guidance, refer to attachment 4G-5, Fall Prevention/Fall Protection Decision Flowchart).

- MOWs shall use guardrail systems, safety net systems, personal fall arrest systems, or some other method that will provide equivalent protection when performing work on low-sloped roofs < 6’ to unprotected side, edge, or hole on a low-sloped roof (< 4/12 slope).
- For fall hazard exposures between 6’-15’ from unprotected side, edge, or hole on low-sloped roofs (< 4/12 slope), follow the requirements set forth by OSHA 1926.500. MOWs shall be protected from falling by using guardrail systems, safety net systems, personal fall arrest systems, or a combination of a warning line system and a guardrail system; a warning line system and a safety net system; a warning line system and a personal fall arrest system; or a warning line system and a safety monitoring system. For roofs 50-feet (15.25 m) or less in width, the use of a safety monitoring system alone [i.e., without the warning line



system] is permitted. (refer to Subpart M, Appendix A of OSHA 1926.500).

For fall hazard exposures greater than >15' from unprotected side, edge, or hole on low sloped roofs (< 4/12 slope), consider the following administrative controls or develop an equivalent fall protection plan that has been reviewed and approved by a "fall protection competent person."

The following fall protection administrative control allows MOWs to work on some of SNL's large, low-sloped roofs without conventional fall protection devices if the work is greater than > 15' feet from an unprotected side, edge, or hole and if no additional hazards have been identified. OSHA states "Distance alone is ineffective to protect workers from unprotected side, edge, or hole."

Work on unprotected low-sloped roofs shall be allowed without [conventional fall protection](#) only under the following conditions:

1. MOWs develop a work plan that addresses fall hazards, describes the worker and safety monitor fall protection duties, and uses designated safe work zones. All affected MOWs shall sign the work plan acknowledging responsibilities and training requirements.
2. Only for other than traditional "construction" type work, (e.g. roofing repairs, heating and a/c, and electrical maintenance, R&D work, of a temporary nature etc.) on low- sloped roofs (< 4/12 slope).
3. A safe work area on the roof must be designated by:
 - Warning lines, which are used **without a monitor**, where the warning lines are at least 15 feet back from the unprotected edge and all of the following are met:
 - A warning line is used 15 feet or more from the edge (or nearest edge of a hole);
 - The warning line meets or exceeds the requirements in §1926.502(f)(2);

- “Marking” the area by some method including painting, tape, chalk, (caution some chemicals may react with roofing membranes and cause damage contact building supervisor for advice).
- 4. There must be at least two people in the work area, one person is designated as the “Safety Monitor,”
- 5. “Safety-monitor” (must have training) and keep him/herself and other employee(s) within the designated safe work zone and greater than 15’ from the edge.
- 6. Safety-monitor has no other duties other than being a “safety monitor”.
- 7. No work or work-related activity is to take place in the area between this designated safe work area and the fall hazard.
- 8. MOWs are prohibited from going past the designated safe work area delineation (marking/warning lines).
- 9. MOWs are **Not** exposed to any fall hazards (closer than 15’ in any direction) while working or accessing the work area.
- 10. MOWs remain on the horizontal surfaces of the roof (not elevated) (< 4/12 slope).
- 11. MOWs have and maintain visual contact, good oral communication, (no language barriers, noise issues, etc.) when performing work.
- 12. Inclement weather does not increase hazards.
- 13. All exposed employees have adequate training: (FPP105 or competent person training FPP110).
- ***Add:** the requirements for “Working on “Rolling Stock” (working from flatbed trucks, trailers, or other similar surfaces)
- MOW shall utilize Fall-Prevention/Protection methods when working on “Rolling Stock” (flatbed trucks, trailers, or other similar surfaces) (Requirements 1910.132 and OSHA General Duty Clause 5a.1).



- Hazards:

- Unprotected open-sided areas created by working near edges of flatbed trucks, trailers or similar surfaces.
- Safe access to these work surfaces.
- Refer to attachment 4G-3, "Rolling Stock".

- Under topic, "Using Fall-Protection Equipment":

- ***Change:** the requirement, "Managers shall ensure that: MOWs are provided with appropriate fall-protection equipment" to "MOWs are adequately trained and appropriate fall-protection equipment is provided."
- ***Add:** the requirement, "Fall-protection equipment is inspected in accordance with the manufacturer's recommendations or as a minimum, inspected annually and documented by a competent person."
- ***Change:** requirements for MOWs using fall-protection to:
 - Not perform work where they are exposed to a fall hazard.
 - Follow the appropriate TWD for the work activity being performed.
 - Read and understand the instructions and warnings on fall-protection equipment prior to use.
 - Inspect each piece of fall-protection equipment before and after use according to the manufacturer's recommendations. Refer to SF 2001-FPE, "Fall Protection Equipment Checklist," for guidance on inspections. The inspection shall include, but not be limited, to the following:
 - The FBH, body belt, and lanyard are stamped with the date of manufacture, manufacturer's name, and the ANSI standard number.
 - D-rings, tongue or billet, and buckle attachments on harnesses and body belts for signs of wear such as the equipment being misshapen, showing signs of exposure to chemicals, or overexposure to sunlight.
 - Equipment webbing for frayed or broken strands.
 - Tongue and friction buckles for distortion.





- Lanyards for cuts, frayed areas, or unusual wearing patterns.
- Lanyard hardware, including snaps and thimbles, for distortion or signs of wear.
- Ensure that any parts of the personal fall-protection system that look worn, misshapen, or that show signs of exposure to chemicals or overexposure to sunlight are destroyed.
- Use compatible components of a fall-arrest system.
- Ensure that when anchoring fall-protection equipment, select an appropriate point at or above the height of the back D-ring. This is especially important when using fall-protection equipment with shock absorbers because they can stretch as much as 42 inches during the shock-absorption process.
- Use only anchorages and anchorage connectors that are capable of supporting at least 5,000 lbs. per person attached or if there is doubt about the integrity or weight-supporting capability of a selected anchor.”
- Wear the appropriate personal fall-protection equipment such as a full-body harness (FBH) with shock-absorbing lanyard (rather than a body belt, which is not used for fall arrest) as outlined in the TWD (Refer to attachment 4G-1, Fall-Protection Equipment and Components).



Note: A body belt may be used in combination with a FBH in positioning work only. Check the manufacturer’s recommendations for details. Refer to attachment 4G-1, “Fall Protection Equipment and Components,” for a diagram of a fall-protection system, components, and subsystems.

- Consult the fall-prevention and protection contact for assistance and questions on the proper use of fall-protection equipment.
- Not reuse fall-arrest systems that were subjected to a fall are:
- Not destroy or discard fall-arrest systems until an investigation is complete.
- Under topic, “Maintaining and Storing Personal Fall-Arrest Systems”:
 - **Add:** guidance statement for “Service Life of the FP Equipment.”



- Under topic, "References":

- ***Delete:** [29 CFR 1926.500](#), *Fall Protection*, **from** Requirements Source Documents.
- ***Delete:** [29 CFR 1926.503](#), *Training Requirements*, **from** Requirements Source Documents.
- **Delete:** SNL, PG470218, Worker Protection Program (WPP), **from** Implementing Documents.
- ***Move:** ANSI Z359.1-1992, Safety Requirements For Personal Fall-Arrest Systems, Subsystems And Components **from** Requirements Source Documents **to** Related Documents.
- **Add:** ANSI/ASSE A10.32-2004, Fall Protection systems- American National Standard for Construction and Demolition Operations **to** Related Documents.
- **Change:** DOE STD 1090-99 to DOE STD 1090-2004.

- Under topic, "Attachment 4G-1, "Fall Protection Equipment and Components:

- **Add:** to item "FBH" description, the statement, "The FBH should have the following components:
 - Front, back, and subpelvic straps
 - A sliding D-ring"
- **Add:** to item "Lanyard" description, the statement, "Lanyards with energy (shock) absorbers may also be outfitted with self-rescuing ladders."
- **Add:** item "EA2," Self-rescue energy shock absorber and the description, "Dissipates energy and limits deceleration forces imposed on the body when a fall arrester engages and provides a self-rescuing device (e.g., a ladder) that is deployed automatically."
- **Add:** the heading, "Calculate the Total Fall Clearance" and all guidance information.

- Under form "SF-2001-FPC"

- **Add:** a reference to SF-2001-FPE as guidance for equipment inspection in Item 2.

- **Change:** the list of equipment called out for inspection in Item 2 to match direction in the parent document.
- Under “**ES&H Manual Glossary**”:
 - ***Add:** the following terms and definitions:
 - **Safety Monitoring System**
 - **Designated Safe Work Zones**
 - **Conventional Fall Protection**
 - **Rolling Stock**
 - **Restraint (Tether System)**
 - **Unprotected Side or Hole**



Section 13A, "Hazards Identification and Classification Process"

This section was revised to:

- This document has been altered by greater than 75% and should be read in its entirety.
- **Add:** A review date to the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed for this section.



ES&H Manual Glossary:


- ***Delete: Category A reactor facilities** – Those production, test, and research reactors designated as such by DOE based on power level (e.g., design thermal power rating of 20 megawatts steady state and higher), potential fission product inventory, and experimental capability.
- ***Change: “High-hazard non-nuclear operation** – Operations with potential for onsite or offsite impacts to large numbers of persons or for major impacts to the environment.” **to** **“High-hazard industrial operation** – Operations with potential for onsite or offsite impacts to large numbers of persons or for major impacts to the environment.”
- ***Change: “Low-hazard non-nuclear operations** – Low-hazard non-nuclear operations are those that present minor onsite impacts (within the boundaries of SNL-controlled



areas) and negligible offsite impacts (outside the boundaries of SNL-controlled areas) to people or the environment. Low-hazard non-nuclear facilities have hazards or operations that could potentially cause injury to more than three workers and would require a hazard classification of "low" and require a Hazards Analysis (HA).

DOE unique hazards or public perceived DOE unique hazards such as explosives, radiological materials, high-powered lasers, rail guns, biological, etc., would be considered low-hazard operations and would require additional analysis and documentation, which could result in a potentially higher hazard classification.”

to



“**Low-hazard industrial operations** – Low-hazard industrial operations are those that only have onsite impacts (within the boundaries of Sandia-controlled premises) to people or the environment. Low-hazard industrial facilities have hazards or operations that could potentially cause significant injury and require the hazards analysis (HA) section of the PHS to be completed.

DOE unique hazards or public-perceived DOE unique hazards such as explosives, radiological materials, high-powered lasers, rail guns, biological, etc., would be considered low-hazard operations and would require additional analysis and documentation, which could result in a potentially higher hazard classification.”

- ***Change:** “**Moderate-hazard non-nuclear operations** – Moderate-hazard non-nuclear operations are those that present considerable potential onsite impacts to people or to the environment but only minor offsite impacts, at most.” to “ **Moderate-hazard industrial operations** – Moderate-hazard industrial operations are those that have the potential for significant onsite impacts to people or to the environment.”
- ***Change:** “**Non-nuclear facilities, high-hazard** – See definition of "[high-hazard non-nuclear facilities](#).” to “ **Industrial facilities, high-hazard** – See definition of "[high-hazard industrial operations](#).”
- ***Change:** “**Non-nuclear facilities, low-hazard** – See definition of "[low-hazard non-nuclear facilities](#).” to “ **Industrial facilities, low-hazard** – See definition of "[low-hazard industrial operations](#).”
- ***Change:** “**Non-nuclear operations, moderate hazard** – See definition of "[moderate-hazard non-nuclear operations](#).” to “**Industrial operations, moderate hazard** – See definition of "[moderate-hazard industrial operations](#).”
- ***Change:** “**Primary Hazard Screening (PHS)** – The hazard analysis process and the



documented output of the process in which one or more people familiar with an operation answer questions posed by the Integrated Safety Management System (ISMS) Software, which subsequently identifies the hazards, the major requirements for hazards controls, and the operation's hazard category. For example:

- Business occupancy (office)
- Standard industrial hazard
- Low hazard non-nuclear
- Moderate hazard non-nuclear
- Accelerator
- Category 3 nuclear
- Category 2 nuclear



Note: SNL does not currently operate any high-hazard non-nuclear, category A reactor, or category 1 nuclear operations.

The PHS is part of every operation's authorization basis. The hazard category determines if additional analyses and documents are also required for the authorization basis.

to

“Primary Hazard Screening (PHS) – The hazard analysis process and the documented output of the process in which one or more people familiar with an operation answer questions posed by the Integrated Safety Management System (ISMS) software, which subsequently identifies the hazards, the major requirements for the identified hazards and controls, and the operation's hazard classification. For example:

- Business occupancy (office)
- Standard industrial hazard (SIH)
- Low
- Moderate
- High*





- Accelerator
- Category 3 nuclear
- Category 2 nuclear
- Category 1* nuclear

*Sandia does not currently operate any high-hazard industrial operations, or hazard category 1 DOE nuclear facilities.

The PHS is part of every operation's authorization basis. The hazard classification determines if additional analyses and safety documentation are required for the authorization basis.”



September 29, 2006

Section 4H, "Excavations, Trenches, and Floor or Wall Penetrations"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Add:** The Review Date to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- Under topic, “Excavation or Penetrations Activities”:
 - ***Add:** The following subordinate bullet to the bullet “Digging, saw cutting, drilling, coring, or trenching into” concerning activities which require an Excavation Permit (SA 6610-EP):
 - Excavation review (see SA 6610-EP (Word file/Acrobat file), Excavation Permit).
 - **Add:** The following note under the last subordinate bullet listed under the bullet titled “Obtain the following types of Sandia excavation or penetration permits from their Division ES&H Team before performing work”:
 - Note: See [Section 4V](#), “Construction and Construction-Like Activities,” for requirements pertaining to the review of trenches and excavations.



- Under topic, "References":

- **Add:** "Chg 4" to the end of the Requirements Source Document "DOE 5480.4."
- **Add:** The following document under "Implementing Documents":
 - SNL, Section 4V, "ES&H for Contracted Construction and Construction-Like Activities."

Section 6T, "Asphyxiating Environments"

Note: This section is new and should be read in its entirety.

September 22, 2006

Section 4E, "Hot Work Safety"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- ***Add:** The Review Date in the header to indicate that an ES&H Manual Self-Assessment (SA) was completed.
- ***Change:** "High Fire Risk" in the TOC and section to "Locations Presenting Elevated Fire Risk."
- ***Replace:** The Sample Hot Work Permit.
- **Clarify:** The use of the terms "fire watch" and "fire watchers" throughout the section.
- Under the topic, "Applicability":
 - **Add:** Under the last bullet, " **IF** the operation of the small flame is specifically addressed in the lab's OP or SOP then no permit is needed, but if not (1 time operation etc) then a permit should be obtained."
- Under the topic, "Training":
 - **Clarify:** The first "Role or Work Activity" by including "electric arc welding" to the

list.

- **Clarify:** The fourth “Role or Work Activity” by defining the type of grill as a “barbecue grill.”
- ***Add:** “FRP106” under required training for the last Role or Work Activity.
- ***Add:** Under the note: “ Sandia employees and Sandia-Directed Contractors who perform hot work or are designated as fire watchers are required to have taken FRP106 (Fire Extinguisher Training Hands-On) prior to performing hot work or firewatch duties, and every three years thereafter. If FRP106 (Fire Extinguisher Training Hands-On) is not available at the time the Sandia employee or Sandia-Directed Contractor (who has not taken FRP106 within the last three years) wants to perform hot work or firewatch duties, then offsite vendor training is acceptable for the interim. (SNL/NM only – no offsite vendor training is available at SNL/CA. At SNL/CA, FRP 106 is offered monthly).”
- Under the topic, “Hot Work Activities Summary,” in the table:

- ***Delete:**
 - “At SNL/NM, soldering that does not involve an open flame.”
 - “At SNL/CA, all soldering is considered to be hot work and is subject to issuance of a permit.”
- **Clarify.** The “Propane-fired grill” as the “Propane-fired barbecue grill use.”
- ***Delete:** “ At SNL/NM, mechanical cutting or grinding in hazardous locations, such as confined spaces and locations having the potential for forming flammable or explosive mixtures of vapors, mists, or dust.”
- ***Change:** “ At SNL/CA, all spark-producing cutting or grinding is considered hot work.” to “All spark-producing cutting or grinding is considered hot work.”
- ***Add:** Under the table, “Note: The PPE column is intended to alert workers to those activities likely to require special PPE. Refer to Chapter 6 or consult with the Division ES&H Customer Support Team for additional guidance.”

● Under the topic, “Other Qualifications”:

- ***Change:** The first two bullets:

- View, at least once a year, a welding and cutting fire safety film provided by the [fire protection](#) contact. At SNL/NM, the fire protection contact maintains records of this training. At SNL/CA, the department performing the hot work maintains these records.
- View a fire extinguisher training film at least once a year. The [fire protection](#) contact maintains records of this training. At SNL/CA, the organization performing the hot work maintains records of this training.

To:

- View, at least once a year, a welding and cutting fire safety film provided by the fire protection contact. At SNL/NM, the fire protection contact maintains records of this training. At SNL/CA, taking FRP 106 satisfies this requirement.
- View a fire extinguisher training film at least once a year. The fire protection contact maintains records of this training. At SNL/CA, taking FRP 106 satisfies this requirement.

- ***Change:** The third bullet, “Welding operations” to “hot work operations.”

- Under the topic, “Hot Work Permits”:

- **Clarify:** First bullet to include what will be posted "... posting the permit at hot work sites..."

- ***Delete:** From the first subordinate set of bullets:

- Open-flame soldering operations. A permit is not required for soldering operations that do not involve open flames.
- Welding and cutting operations performed in garages.
- Soldering, welding, or cutting operations on [used containers](#). At SNL/CA, the [site fire marshal](#) approves hot work on cleaned containers prior to the hot work operation.

- ***Delete:** Under the first subordinate set of bullets, “ Managers shall be responsible for obtaining authorization, approval, or waiver for any of the situations below (noted in the Special Conditions section of the hot work permit):”

- ***Change:** To a main bullet under the first subordinate set of bullets:

- Maintaining permits for the duration of activities, not to exceed the periods for which permits are issued

- ***Add:**

- Ensuring that areas are inspected for adherence to the requirements listed on the hot work permit.
- Ensuring that necessary mechanical ventilation is provided.
- Ensuring that the Industrial Hygienist on the [Division ES&H Customer Support Team](#) is contacted to complete an occupational exposure assessment (OEA) prior to obtaining a hot work permit or initiating hot work activities involving brazing, thermal cutting, or welding. Contractor Personnel [Contractor-Directed] are also responsible for completing a representative occupational exposure assessment (OEA) for their employees . An OEA is required prior to the commencement of the initial hot work activity and when changes in materials, work controls, or any operational conditions may impact personnel exposure. If a documented OEA has been previously completed and is representative of the proposed hot work activity, an additional OEA is not necessary.

"Operators shall work on objects to be welded or cut in a designated welding area or an area that satisfies the requirements of the hot work permit.

Managers shall be responsible for obtaining authorization, approval, or waiver for any of the situations below (noted in the Special Conditions section of the hot work permit)"

- **Delete:** From the last three bullets, "contact" from the end of sentence.
- ***Delete:** Under the last bullet:
- Managers shall be responsible for ensuring that:
 - Areas are inspected before hot work is performed.
 - Necessary mechanical ventilation is provided.

"Operators shall work on objects to be welded or cut in a designated welding area or an area that satisfies the requirements of the hot work permit."

- Under the topic, "Hot Work Operations":



- **Clarify:** In the second bullet, Prevent the passage of sparks “or slag” to adjacent areas containing combustible materials through openings or cracks in walls, floors, ducts or shafts within the hot work area by one or more of the following:
 - Tightly covering “openings and cracks” with non-flammable/non-combustible material.

- Under the topic, “Locations Presenting Elevated Fire Risk”:

- ***Add:** “Outdoors where dry brush and vegetation is present.”

- Under the topic, “Fire Watching” requirements:

- ***Add:** The following requirements under “Fire watchers shall”:

- Ensure they have all required training.

- ***Change:** “Have the appropriate fire extinguishers and be annually trained in their use.” to “Ensure they have the appropriate fire extinguishers and be annually trained.”

- ***Add:** Under the bullet, “Warn operators if hazardous conditions develop.”

- Be cognizant of the surroundings to ensure facility safety and property protection.
- Provide for the safety of the operator by carefully observing the operator for clothing fires that may go unnoticed by the operator who is focusing on the hot work task.

During an emergency or if instructed to do so, Operators and Fire Watchers shall:

- Shut down all hot work operations.
- Evacuate the building.
- Report immediately to a Security Officer or the Incident Commander the exact location and state of the hot work operation.
- **Not** re-enter the building until authorized to do so by emergency response personnel.”

- Under the topic, “References,” in the list of “Requirements Source Documents”:



- ***Add:** International Fire Code, International Code Council, *International Fire Code*. Falls Church, VA (2006).
- Attachment 4E-1 – “Sample Hot Work Permit”:
 - ***Note:** Over 75% of this section is either new or has changed and should be read in its entirety.
- To the ES&H Glossary:
- ***Add** : The following definitions:
 - **Brazing**
 - **Exposed**
 - **Occupational exposure assessment**
 - **Thermal cutting**
 - **Welding**



September 22, 2006

Chapter 5, "Fire Protection"

Note: (*) asterisk denotes substantive change.

This section was revised to:



- Under the topic, “Permits,” under the subtopic, “Requirements”:
 - ***Add:** “Members of the Workforce shall contact the Industrial Hygienist on the [Division ES&H Customer Support Team](#) to complete an occupational exposure assessment (OEA). Contractor Personnel [Contractor-Directed] are also responsible for completing a representative occupational exposure assessment (OEA) for their employees. An OEA is required prior to obtaining a hot work permit or initiating hot work activities involving brazing, thermal cutting, or welding. An OEA is required prior to the commencement of the initial hot work activity and when changes in materials, work controls, or any operational conditions may impact

personnel exposure. If a documented OEA has been previously completed and is representative of the proposed hot work activity, an additional OEA is not necessary.”



September 21, 2006

Section 13D, "Readiness Review Process - Planning, Review, and Approval"

Note: An asterisk (*) indicates a substantive change

- This document has been altered by greater than 75% and should be read in its entirety.
- **Add:** A review date to the header to indicate that an ES&H Manual Self Assessment (SA) checklist was completed for this section.
- **Change:** The Subject Matter Expert (SME) **from** Barry Goldstein **to** Caren Wenner.



**Administrative Changes Only
September 20, 2006**

Chapter 8, "Occupational Radiation Protection"

Note:(*) asterisk denotes substantive change.

- Under topic “References, Related Documents”:
 - **Update:** All of the listed documents to reflect the current titles.
 - **Delete:** Archived documents as follows:
 - GN470011, "*Separating Eating and Drinking from Toxic Materials.*"
 - [GN470073](#), "*Mixed Waste Generator Operations.*"
 - [GN470090](#), "*NESHAP Implementation Procedures.*"



September 7, 2006

Section 4C, "Lockout/Tagout (LOTO)"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- In the footer throughout,
 - **Change:** Email contact info from “Mark Warner, Linda Gillis” to “Mark Warner, Bob Goetsch.”
- Under topic, “Procedure, under sub-topic, “Written LOTO Procedure””:
 - * **Change:** From “An equipment-specific procedure shall be written if all of the eight conditions below are not met” to “An equipment-specific procedure shall be written if any of the eight conditions below are **not** met.”
- Under topic, “Related Hazards and Activities””:
 - **Change:** Format of citation from “ CPR400.1.1.7/ [GN470037](#), *Administrative Control Procedure*” to “ CPR400.1.1.7/ [GN470037](#), “Administrative Control Procedure” to allow consistency.
- Under topic, “References””:
 - **Change:** “Related Documents” citation from “DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities*” to “DOE O 5480.19, Chg 2, *Conduct of Operations Requirements for DOE Facilities.*”

Administrative Changes Only September 1, 2006

The [ES&H Manual Glossary](#) was revised to:

Change. The Subject Matter Expert in the header **from** Linda Gillis **to** Bob Goetsch.

- **Change.** The SME and document contact in the footer from Linda Gillis; rsgoets@sandia.gov **to** Bob Goetsch; rsgoets@sandia.gov.

September 1, 2006

Section 6U, "Chemical Barcoding and Inventory"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- **Add:** Review Date to the header to indicate that an *ES&H Manual* Self-Assessment (SA) was completed on this section.
- ***Add:** New form: "SF 2001-BAI, "Biological Organism/Toxin Inventory Form."
- **Change:** the Subject Matter Expert from Sylvia Saltzstein to Randy Castillo.
- ***Delete:** the "Training" topic.
- Under topic, "Chemical Inventory Responsibilities":
 - ***Add:** to the second bullet under "Requirements," a second sentence: "All tools and procedures for maintaining the chemical inventory can be found at the [CIS home page](#)."
 - ***Add:** three bulleted items under "Requirements":
 - "Ensuring that personnel avoid ordering excess quantities of chemicals.
 - Ensuring that chemical inventory is limited to the minimum quantity required for laboratory or process activities.
 - Ensuring proper inventory rotation is used to minimize the age of chemicals in storage."
- Under topic, "Identify Where Chemicals are Stored":
 - ***Add:** under "Requirements," for all three bullets: clarification about when owners of chemical storage locations need to complete SF 2001-CIL, "Location Description Form."

- Under topic, “Barcode and Report Chemicals Received”:
 - ***Add:** under “Requirements,” in the first two bullets: Clarification on when Members of the Workforce need (and don’t need) to barcode incoming chemical containers and gas containers.
 - **Move:** the second bullet (beginning “For all other chemicals use SF 2001-CII...”) so that it’s the first bullet under “Requirements.”
 - **Change:** Source of gas cylinders from Matheson Tri-Gas to JIT.
 - ***Add:** A third bullet under “Requirements”: “For microorganisms and biological toxins, use SF 2001-BAI, “Biological Organism/Toxin Inventory Form.”
- Under topic, “Report Static Chemical Inventory Information,” under the sub-topic “Requirements”:
 - **Add:** Under the first bullet in the first paragraph, in the first two sub-bullets, the word “or” between “tank” and “bath.”
 - **Delete:** Under the first bullet, in the first two sub-bullets, the word “etc.”
 - ***Delete:** In the second paragraph, from the first (only) sentence, the phrase, “if the refill component was not previously barcoded.”
- Under topic, “Report Static Chemical Inventory Information,” under the sub-topic “Guidance”:
 - **Change:** the phrase “for guidance such as what constitutes a tank or bath or whether any chemicals in question should be reported as static” **to** “to help them determine whether certain chemical storage constitutes a static inventory.”
- Under topic, “Transfer or Removal of Barcoded Chemicals in the CIS Inventory”:
 - ***Change:** Under “Requirements,” in the first bullet, the sentence “Remove the entry from the CIS inventory of an empty barcoded chemical container that has been thrown away or any container sent to the hazardous waste facility” **to** “Remove the barcode from the CIS inventory and manage the empty chemical container according to site-specific waste management procedures.”
 - **Move:** Under “Requirements,” the Note under the second bullet to under the first bullet.





- **Change:** Under “Requirements,” the text of the Note just moved **to**: “For material deemed [hazardous waste](#), submit a Waste Description Disposal Request (WDDR) for the container to be picked up by Waste Management Personnel for final disposal. Waste Management Personnel will transmit the disposal information to CIS. No further action is required of Members of the Workforce.”
- ***Change:** Under “Requirements,” in the second bullet: the phrase at the end of the sentence, “when the chemical is permanently moved from its current location,” **to** “when the chemical container is to be stored in a different chemical storage location.”an additional bulleted item under “Members of the Workforce shall...” about transferring a barcoded chemical container within the CIS inventory.
- **Move:** Under “Requirements,” the last sentence: “Gas cylinders purchased from Just-In-Time (JIT) will be picked up and disposed of by the vendor. No further action is required of Members of the Workforce” **into** a second Note under the first bullet.



- Under topic, “Chemical Inventory Reconciliation”:
 - ***Change:** Under “Requirements,” the first sentence: “Managers of organizations that store or use chemicals shall allow the CIS Help Line: 844-MSDS (NM) or 294-MSDS (CA) to conduct annual [chemical inventory reconciliations](#)” **to** “Managers of organizations that store or use chemicals shall allow CIS personnel to conduct annual [chemical inventory reconciliations](#).”
 - ***Change:** Under “Requirements,” the last sentence: “ES&H coordinators and laboratory owners whose responsibilities include storing or using chemicals shall assist the CIS Help Line: 844-MSDS (NM) or 294-MSDS (CA) in scheduling and coordinating annual chemical inventory reconciliations.” **to** [ES&H coordinators](#) and laboratory owners whose responsibilities include storing or using chemicals shall assist CIS staff: 844-MSDS (NM or TTR) or 294-MSDS (CA) in scheduling and coordinating annual chemical inventory reconciliations.”



- Under topic, “Related Hazards and Activities,” in the table:
 - ***Add:** a new first row after the heading: “Biological Agents and Biosafety” under “Hazard/Activity,” and “Section 6N, “Biological Agents and Biosafety,” under “Reference.”
- Under topic, “References”:
 - ***Add:** to “Requirements Source Documents”:



- DOE O 440.1A, "Worker Protection Management for DOE Federal and Contractor Employees"
- DOE O 450.1, Change 1, "Environmental Protection Program"
- **Delete:** All references in "Related Documents."
- ***Move:** from "Requirements Source Documents" to "Implementing Documents":
 - New Mexico Administrative Code, 20 NMAC 11.01-103, *Albuquerque/Bernalillo County Air Pollution Control Regulations*.
 - State of California, *Hazardous Materials Release Response Plans and Inventory Law*
 - California Health and Safety Code, Chapter 6.95 § 25500, et seq.
 - Corporate Chemical Information System Home Page
 - SNL/CA Hazardous Materials Management Program (CIS) Home Page
- In "Attachment 6D-1":
 - **Change:** the SME from Sylvia Saltzstein to Randy Castillo.
 - ***Add:** In Table 1, "Items that Require Barcodes," as the third row: "Microorganisms and biological toxins (Section 6N – "Biological Agents and Biosafety)."
 - ***Delete:** In Table 2, "Items that do **Not** Require Barcodes," the entire fourth row: "Biological Hazards."
 - **Add:** In Table 2, "Items that do **Not** Require Barcodes," in the tenth row: additional wording after "Portable containers as defined by OSHA": "(e.g., acetone squeeze bottles)."



August 28, 2006

Section 6I, "Confined Space Entry"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- Under topic, “Entry Into Permit-Required Confined Spaces”:

- ***Change:** The section note in “Obtaining Entry Permits” from “There are three different types of [confined space entry permits](#); each is designed to accommodate different [entry](#) conditions and levels of rigor necessary for entry. An [electronic technical work document \(eTWD\)](#) ([access the eTWD tool](#)) may be used as an acceptable alternative to any of the permits. Attachment 6I-2 ([Word file/Acrobat file](#)) illustrates the type of information that must be provided to obtain a permit or eTWD” to “There are three different types of [confined space entry permits](#); each is designed to accommodate different [entry](#) conditions and levels of rigor necessary for entry. Confined Space Permits shall only be used for one work shift. Members of the Workforce involved in work that extends beyond a single work shift must obtain a new permit. An [electronic technical work document \(eTWD\)](#) ([access the eTWD tool](#)) may be used as an acceptable alternative to any of the permits. Attachment 6I-2 ([Word file/Acrobat file](#)) illustrates the type of information that must be provided to obtain a permit or eTWD.”

- Under subtopic, “General Responsibilities of Supervisors Authorizing Entry (SAEs)”:

- ***Delete:** The requirement for Supervisors Authorizing Entry (SAEs) to ensure that SF 2001-CSS ([Word file/Acrobat file](#)) (Confined Space Permit Sign-In/Sign-Out Sheet for Emergency Response) is used when a permit or checklist extends beyond a single day.

- Under subtopic, “Emergency Notification, Response, and Rescue”:

- **Add:** In the section note a link to the site confined space rescue plan.
- **Clarify:** In the section note that if rescue services are unavailable, SNL Emergency Management representatives will communicate the information to the Supervisor Authorizing Entry (SAE).

[ES&H Manual Glossary](#)

- ***Change:** The definition of “**Facility**” from “A distinct building, plant, storage unit, laboratory, or test range that is within a fenced or otherwise access-controlled operating area within the boundaries of a DOE- or contractor-controlled site.

A facility may include any equipment, structure, system, process, or activity that fulfills a specific purpose. Examples include the following:

- Accelerators
- Fusion research devices
- Nuclear reactors
- Microelectronics production operation
- Ceramic processing operations
- Research and development laboratories
- Testing devices
- Experiments
- Waste processing systems burial grounds
- Packaging and transportation-related activities
- Storage areas

In administering certain ES&H management programs at SNL, it is acceptable for multiple facilities to occupy a single building. Conversely, multiple related operations that are conducted in separate buildings may comprise a single facility."

to

"Land, buildings, and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein, including site development features outside the plant, such as landscaping, roads, walks, parking areas, outside lighting and communication systems, central utility plants, utilities supply and distribution systems, and other physical plant features. These include any of the DOE-owned, -leased, or -controlled facilities, and they may or may not be furnished to a contractor under a contract with DOE."

• ***Delete:** Reference to Radiological Work Permits (RWPs) in the **Electronic Technical Work Document (eTWD)** definition, per NTS Corrective Actions #169 and #170 for (NTS-2005-0013 TWD disengagement from RWPs).

- ***Delete:** Reference to Radiological Work Permits (RWPs) in the **Technical work document (TWD)** definition, per NTS Corrective Actions #169 and #170 for (NTS-2005-0013 TWD disengagement from RWPs).
- **Add:** In the definition of Technical work document (TWD), a note with the following text: "For the purposes of the *ES&H Manual*, radiological work permits (RWPs) are **NOT** considered TWDs.
- ***Delete:** N-butanol from the list of **ototoxic chemicals**.
- ***Add:** Carbon monoxide to the list of **ototoxic chemicals**.
- ***Add:** Styrene to the list of **ototoxic chemicals**.
- ***Add:** Xylene to the list of **ototoxic chemicals**.

**Administrative Changes Only
August 24, 2006**

Section 17D, "Ozone-Depleting Substances (ODSs)"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Mike Du Mond" **to** "Joanna Eckstein."

Section 18E, "Environmental Release Reporting"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Mike Du Mond" **to** "Joanna Eckstein."
- **Change:** The California counterpart **from** "James Bartel" **to** "Robert Holland."

**Administrative Changes Only
August 18, 2006**

Section 17C, "Air Emissions Control Measures"

This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Mike Du Mond" **to** "Joanna Eckstein."
-

Administrative Changes Only August 17, 2006

Section 4S, "Powered Carts"

This section was revised to:

- **Clarify:** the requirement, "Sandia/CA drivers shall not drive on East Avenue unless on official business."
-

Administrative Changes Only August 16, 2006

Section 17B, "Air Permits"

This section was revised to:

- In Section 17B and attachments:

- **Change:** The Subject Matter Expert (SME) **from** "Mike Du Mond" **to** "Joanna Eckstein."
- **Change:** The Contributor to Timothy Stirrup.
- In the Direct Access Services List:
 - Under topic, "Air Quality":
 - **Change:** The NM contact for "Air Emissions Inventory," "Ozone-Depleting Substances," and "Permits" was changed from) **from** "Mike Du Mond" **to** "Joanna Eckstein."
 - Under topic, "Environmental Permits":



- **Change:** The NM contact for "Air" was changed) **from** "Mike Du Mond" **to** "Joanna Eckstein."
 - Under topic, "Ozone-Depleting Substances":
 - **Change:** The NM contact was changed from) **from** "Mike Du Mond" **to** "Joanna Eckstein."

Administrative Changes Only August 10, 2006

Section 4A, "Working in High-Injury-Potential/Remote Operations"



This section was revised to:

- **Change:** The Subject Matter Expert (SME) **from** "Ken Miles" **to** "Stephen Warner."

The Direct Access Services List was changed as follows:

In the listing for "Aviation charters: SNL aviation safety officials":

- **Change:** "officials" to "official"
- **Change:** "Ken Miles (NM), Stephen Warner (NM)" to "Stephen Warner (NM)."

In the listing for "Transportation safety (aviation)":

Change: "Ken Miles (NM), Stephen Warner (NM)" to "Stephen Warner (NM)."



Section 13E, "Risk Criteria for Flight Vehicle Operations"

This section was revised to:

- **Change:** The Subject Matter Expert **from** "Ken Miles" **to** "Stephen Warner."

Section 22C, "Lessons Learned"

This section was revised to:

- **Add:** A Review Date to the header to indicate a ES&H Manual Self-Assessment (SA) checklist was completed on this section.
- **Change:** At SNL/CA, the subject matter expert from Terry Garner to Bernie Bernal throughout the parent document and on the Direct Access Services (DAS) List.
- Under topic, "References":
 - **Delete:** A requirements source document reference, "DOE O 232.1A." DOE orders (DOE O 232.1A and DOE M 232.1-1A) have been cancelled and the contract has been modified to delete the reference to the requirements in these cancelled orders.
 - **Delete:** A related source document, "DOE M 232.1.1-2" due to its removal from the Baseline of Directives.
 - **Add:** New DOE manual number within the list of related source documents, "DOE M 231.1-2."

**Administrative Changes Only
August 9, 2006**

Section 18E, "Environmental Release Reporting"

This section was revised to:

- **Add:** The Review Date to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- **Change:** Throughout the section the title referenced for Section 10F **from** "Oils, Greases, and Fuels" **to** "Oil and Fuel Storage."
- Under topic, "Planned Releases":
 - **Change:** The title reference to Chapter 15 in the third bullet **from** "Emergency Preparedness" **to** "Emergency Preparedness and Management."
- Under topic, "Unplanned Releases":



- **Change:** The first sentence **from** “Members of the Workforce shall immediately report to the applicable hotline (see Chapter 15, "Emergency Preparedness") any unplanned release, regardless of amount or location, of any radioactive material or regulated solid, liquid, or gas” **to** “Members of the Workforce shall immediately report, as per Chapter 15, "Emergency Preparedness and Management,” any unplanned release, regardless of amount or location, of any radioactive material or regulated solid, liquid, or gas to the applicable emergency or non-emergency hotlines listed in the tables below:”
- **Add:** Table of phone numbers to call for an emergency and a table of phone numbers to call for a non-emergency.

- **Change:** The first sentence in the second paragraph **from** “Managers of permitted processes such as air discharges or wastewater discharges shall notify the applicable hotline (see Chapter 15, "Emergency Preparedness") of any significant deviation from normal operating conditions” **to** “Managers of permitted processes such as air discharges or wastewater discharges shall report, as per Chapter 15, "Emergency Preparedness and Management,” any significant deviation from normal operating conditions to the applicable emergency or non-emergency hotlines listed in the tables above.”



- **Change:** The fourth bullet from “Activation of emergency response teams or emergency procedures” to “Activation of Site Emergency Response Teams or emergency procedures.”

- Under topic, “Related Hazards and Activities”:

- **Add:** The following as a reference for Mixed Waste Operations: “For SNL/CA see GN470075 – Guidelines for Waste Generators at SNL/CA.”
- **Add:** The following as a reference for Radioactive Waste: “For SNL/CA see GN470075 – Guidelines for Waste Generators at SNL/CA.”

- Under topic “References” and under subtopic “Related Documents”:

- **Change:** The title for reference “40 CFR 355” **from** “Emergency Planning and Release Notification” **to** “Emergency Planning and Notification.”

- **Delete:** The following reference:

- California, Title 22, Section 66261.126, Appendix XI, "Identification and Listing of Hazardous Waste."



- **Delete:** The following reference:
 - California , Title 26, Section 26-23-2550, State Water Resources Control.
- **Add:** The following reference:
 - Code of Regulations (CCR) Title 23 Waters, Division 3 State Water Resources Control Board and Regional Water Quality Control Boards, Chapter 9 Waste Discharge Reports and Requirements, Chapter 9.2 Reportable Quantities and Reporting Requirements: Section 2550 – Reportable Quantity for Sewage and Section 2551 – Reportable Quantity for Hazardous Waste and Hazardous Substances.
- **Replace:** The reference “DOE 5400.1, General Environmental Protection Program” with “DOE O 450.1, Chg 1, Environmental Protection Program.”
- **Replace:** The reference “DOE 5484.1, Environmental Protection, Safety and Health Protection Information Reporting Requirements” with “DOE M 231.1-1A, Environment, Safety and Health Reporting Manual.”
- **Replace:** The reference “DOE O 232.1A, Occurrence Reporting and Processing of Operations Information” with “DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information.”

**Administrative Changes Only
August 8, 2006**

Section 4U, "Aviation Safety"

This section was revised to:

- **Change:** At SNL/NM, the Subject Matter Expert (SME) **from** "Ken Miles" **to** "Stephen Warner." throughout the parent document and all attachments.

August 2, 2006

Section 22E, "Environment, Safety, and Health and Emergency Management Corrective Action Management Program (CAMP)"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Change:** In the second sentence, “Corporate Corrective Action Development and Tracking Process” to “Corporate Corrective Action Process.”
- Under topic, “Scope”:
 - **Change:** In the last sentence, “verification review of the CAP” to “verification of corrective action completion of the CAP.”
- Under topic, “Camp Objectives”:
 - **Change:** In the second bullet, “verified as effective” to “verified as completed.”
- Under topic, “Roles and Responsibilities”:
 - ***Add:** Under the subtopic, “Finding CAP Owner,” as the fifth bullet, “Coordinates ES&H Manual and Supplements changes with ES&H Manual Information Management Team (IMT).”
 - **Change:** Under the subtopic, “Finding CAP Owner,” in the sixth bullet, “Department 10312” **to** “ES&H Assurance, Planning & Behavior Based Safety Department”
 - **Change:** Under the subtopic, “Finding CAP Owner,” as the eighth bullet, from “Verifies CAP effectiveness 90 days after completion of last corrective action/milestone .” To “Verifies completion of Corrective Actions in the CAP 90 days after completion of last corrective action/milestone.”
 - **Change:** Under the subtopic, “Responsible Manager,” as the eighth bullet, from “Ensures verification/effectiveness review of CAP is conducted ” **to** “ Ensures verification for completion of Corrective Actions is conducted.”
 - ***Add:** A new subtopic, “Information Management Team Lead Writer,” with three bullets, as the final subtopic under “Roles and Responsibilities.”
- Under topic, “Corrective Action Management Program”:
 - ***Add:** Under the subtopic, “Receipt of ES&H Findings or Observations/ Opportunities for Improvement (OFI),” in the first paragraph, as the third bullet, “CAMP Project Lead also receives findings/observations and OFIs through the ES&H and Emergency Management Center’s Programmatic Self-Assessments,

ES&H Issues from the ES&H Issues Management Review Committee, Chief Defense Nuclear Safety (CDNS) audits, and other sources.”

- ***Add:** Under the subtopic, “Receipt of ES&H Findings or Observations/ Opportunities for Improvement (OFI),” in the second paragraph, as the fifth sentence, “ The CAP Owner also notifies the Lead Writer of the IMT of those CAPs which involve changes to the ES&H Manual and Supplements.”
- **Add:** Under the subtopic, “Receipt of ES&H Findings or Observations/Opportunities for Improvement (OFI),” in the second paragraph, as the seventh sentence, “Observations are tracked in the ES&H and Emergency Management Center’s CATS Database.”
- **Change:** Under the subtopic, “OA CAP and Corrective Actions/Milestones Requirements,” in the sixth bullet, item 2, from “A verification effectiveness review has been conducted . . .” **to** “A verification of completion of Corrective Actions has been conducted . . .”
- **Change:** Under the subtopic, “NNSA/SSO CAP and Corrective Actions Requirements,” in the sixth bullet, first sentence, from “ CAP includes verification for effectiveness review as the last corrective action to be completed within 90 days ” **to** “CAP includes verification of completion of Corrective Actions as the last corrective action to be completed within 90 days. ”
- **Change:** The subtopic, “ES&H, Quality, and Safeguards & Security Assessments Department CAP & Corrective Actions Requirement ,” **to** “ES&H, Quality, and Safeguards & Security Audits Department CAP & Corrective Actions Requirement.”
- **Change:** Under the subtopic, “ES&H, Quality, and Safeguards & Security Audits Department CAP & Corrective Actions Requirement.,” in the first sentence, the department name from “ES&H, Quality, and Safeguards and Security Assessments Department” to “ES&H quality, and Safeguards and Security Audits Department.”
- Under topic, “References”:
 - **Change:** Under the subtopic, “Requirements Source Documents,” in the fourth item (for CPR400.1.3.11), “Corporate Corrective Action Development & Tracking Process” to “Corporate Corrective Action Process.”

**Administrative Changes Only
August 2, 2006**



Chapter 3, "Office Safety"

This section was revised to:

- **Change:** The Review Date to show that a self-assessment was done.
-

Administrative Changes Only July 24, 2006

Section 4C, "Lockout/Tabout (LOTO)"

This section was revised to:



- Under the topic, "Procedures":
 - **Add:** Under the table, "Written LOTO Procedure," the following guidance: "**Note:** In most cases, completing the optional Equipment-Specific LOTO Procedure (ESLP) form will satisfy the requirements of this procedure. Consult with the LOTO SME for assistance."
-

Administrative Changes Only July 19, 2006

Attachment 1D-5, "Required Training for all ES&H Coordinators"

This attachment was revised to:

- **Change:** ISMS Software Training [ISMS100] Course length from "1 hour" to "4 hours."

Section 4J, "Material Handling - Cranes, Hoists, and Forklifts"

This section was revised to:

- **Add:** In Attachment 4J-4, "List of Currently Recognized Overhead Rigging Equipment Manufacturers, " the following Manufacturers, along with the Typical Device, Markings, and Web Site:

- Actek Manufacturing & Engineering
- American Drill Bushing Company
- Halfen-Deha
- Jergens

- **Change:** In the Direct Access Services (DAS) list under the heading "Cranes, hoists, and rigging program," the first NM SME listed from Anthony G. Chavez to Danny Donald and the second NM SME from Ernest Sanchez to Craig Hauber.

July 13, 2006

Section 6Z, "Chronic Beryllium Disease Prevention Program "

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Add:** "Review Date: July 10, 2006" to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- **Delete:** The implementation date from the header, "Implementation Date: February 15, 2005."
- **Replace:** Throughout the document, when appropriate, all references to "workers" with the term "Members of the Workforce" and all references to "worker" with the term "Member of the Workforce." Also link the first instance of either of these terms, as they appear in each new heading, to the *ES&H Manual* glossary definition of "Members of the Workforce."
- Under topic, "Applicability":
 - **Add:** The following new paragraph after the second bullet: "The Sandia National Laboratories Chronic Beryllium Disease Prevention Program is comprised of two documents: This ES&H Manual Section and document [PG470203 - Sandia](#)

[National Laboratories Chronic Beryllium Disease Prevention Program](#). This Section addresses the specific requirements to be implemented by organizational management, [Members of the Workforce](#), all [contractors](#) involved in operations or activities that involve beryllium, as well as locations of beryllium contamination on [Sandia-controlled premises](#). The program document is administered by the Industrial Hygiene Program and it identifies how Sandia National Laboratories shall manage and control beryllium exposures.”

- **Change:** The former first sentence after the second bullet from “This document applies to activities on Sandia-controlled premises involving past and/or present exposure, or the potential for exposure to beryllium, and to the disposition and handling of beryllium articles” **to** “This document applies to activities on Sandia-controlled premises involving past and/or present exposure, or the potential for exposure to beryllium, and to the disposition and handling of beryllium articles and beryllium contaminated equipment and other items.”
- **Change:** The first sentence in the last paragraph from “Existing operational tasks that are within the scope of this CDBPP include the Z-Machine Facility located in Technical Area IV at SNL/NM as a beryllium activity, but not meeting the definition of a regulated area” **to** “Existing operational tasks that are within the scope of this CDBPP are presented on the [Beryllium Information Site](#). These activities do not meet the definition of a regulated area.”
- **Change:** The third sentence in the last paragraph from “While performing the update of the SNL site-wide beryllium inventory, several buildings/areas have been identified as having removable contamination” **to** “While performing the update of the SNL site-wide beryllium inventory, several buildings/areas were identified as having removable contamination.”
- **Delete:** The last sentence in the last paragraph: “There are no planned operational tasks within the scope of the CBDPP other than any newly identified contaminated buildings/areas.”

- Under topic, “Training”:

- ***Add:** BEA 100 as required training for MOWS identified as beryllium-associated workers.

- Under topic, “Baseline Inventory”:

- ***Change:** The first note under Requirements from “New operations shall be evaluated and operations...” **to** “New operations shall be evaluated by the Division ES&H Team industrial hygienist and operations...”

- **Change:** The first note under “Guidance” from “Since many commercially available metal products and metal stock contain beryllium, but beryllium may not be identified as a constituent, all activities involving metal that may result in generation of airborne particles should be assessed. This information will be used to identify potential worker exposure to airborne beryllium particulates” **to** “Many commercially available metal products and metal stock contain beryllium; however, beryllium may not be identified as a constituent. As a result, all activities involving metal that may result in the generation of airborne particles should be evaluated for beryllium. This information will be used to identify Members of the Workforce with potential exposure to airborne beryllium particulates.”



- Under topic, “Operational Areas & Beryllium Activities”:

- ***Add:** The following new bullet before the first bullet under Requirements:
 - The [Beryllium Contact](#), or designee, is notified of the intent to start any new beryllium activities or establishment of any new beryllium operational areas. Such new activities require DOE notification.
- ***Add:** The following new bullet before the former first bullet under Requirements:
 - Careful consideration has been given to minimize the number of Members of the Workforce, and the number of opportunities for the Members of the Workforce, to be exposed to airborne beryllium when planning new work.
- ***Change:** The former second bullet under Requirements from “The TWD is provided to the Beryllium Program Subject Matter Expert to provide to Sandia Site Office (SSO) of DOE for information only when it is approved or significantly changed subsequent to approval” **to** “The TWD is provided to the Beryllium Program Subject Matter Expert to provide to Sandia Site Office (SSO) of DOE when it is initially approved or significantly changed subsequent to approval.”
- ***Add:** The following note after the last bullet in Requirements: “**Note:** No task involving potential personal breathing airborne exposure to airborne beryllium outside the scope of the current beryllium activities presented on the Beryllium Information Site may be initiated until a CBDPP Implementation Plan is reviewed by SSO.”



- Under topic, “Respiratory Protection”:

- **Change:** The last bullet under Requirements from “Respirators are made available to any beryllium-associated worker who requests to use a respirator for protection



against airborne beryllium, regardless of the measured” to “Respirators are made available to any beryllium-associated worker who requests to use a respirator for protection against airborne beryllium, regardless of the measured levels.”

- Under topic, “Disposal”:
 - **Change:** The reference for additional waste disposal requirements at the end of the second bullet in Requirements from “Section 19A, Hazardous Waste Management” to “Section 19F, Other Waste.” This is required since the information on beryllium-contaminated waste has been moved from Section 19A to Section 19F.
- Under topic, “Warning Signs and Labels”:
 - **Replace:** The information (text) displayed for each Warning Sign, Warning Label, or Caution Label, with a graphic of the sign/label.
 - ***Add:** a new bullet with the following information regarding Caution labels followed by a graphic of a Caution label:
 - Caution labels are affixed to equipment such as HEPA vacuums (used to clean beryllium-contaminated surfaces) with the following information, specifying the building where used:
 - ***Add:** The following information to the end of the last bullet listed under “Requirements”: “Danger labels shall be red or predominantly red with lettering in contrasting color such as black. Warning labels shall be orange or predominately orange with lettering in a contrasting color. Caution labels shall be yellow or predominantly yellow with lettering in a contrasting color.”
 - **Replace:** The information (text), under “Guidance,” displayed for each sign/label with a graphic of the sign/label.
- Under topic, “Record Keeping and Use of Information”:
 - ***Add:** The following paragraph after the first paragraph in “Requirements,”:
 - Managers shall ensure records that are generated or maintained to document activities involving beryllium including but not limited to archived TWDs, entrance logs, air or wipe sampling reports, log of items released from operational areas, release notification letters and recipient commitment letters shall be considered records as defined in [Sandia Records Management Manual](#) and will be forwarded to the ES&H Records Center with a copy provided to the SME upon completion of the project, activity, or at such time

as they are no longer required for ongoing work.

- Under topic, “Decontamination”:
 - **Add:** The following note prior to the first note listed in Requirements:
 - **Note:** With heavily censored data (greater than 50% of the data points are less than the method detection limit) and no more than one sample result above the release criteria of 0.2 µg Be/100 cm² for a specific surface randomly sampled, professional judgment may be used to determine further actions taken.

- Under topic, “Technical Work Documents”:

- ***Add:** The following new bullet under Requirements at the end:
 - A Chronic Beryllium Disease Prevention Program Implementation Plan (CBDPP IP) is a TWD required for all beryllium activities. The CBDPP IP must specify how the user will comply with all aspects of the corporate CBDPP. In addition to review by the Division ES&H Team IH, the IP requires review and approval by the Beryllium Subject Matter Expert. A copy of the approved IP will be provided to Sandia Site Office.

- Under topic, “Related Hazards and Activities”:

- **Change:** The reference associated with “Generation of beryllium-contaminated waste or beryllium equipment or other items to be disposed of as waste” from “Section 19A, Hazardous Waste Management,” **to** “Section 19F, Other Waste.” This is required since the information on beryllium-contaminated waste has been moved from Section 19A to Section 19F.

- In Attachment 6Z-1:

- **Replace:** The information (text) displayed for the danger and caution equipment labels with a graphic of the label.

- In Attachment 6Z-1, Attachment 6Z-2, and Attachment 6Z-3:

- **Delete:** The implementation date from the header, “Implementation Date: February 15, 2005.”
- **Add:** The following new paragraph after the second bullet: “The Sandia National Laboratories Chronic Beryllium Disease Prevention Program is comprised of two



documents: This ES&H Manual Section and document [PG470203 - Sandia National Laboratories Chronic Beryllium Disease Prevention Program](#). This Section addresses the specific requirements to be implemented by organizational management, [Members of the Workforce](#), all [contractors](#) involved in operations or activities that involve beryllium, as well as locations of beryllium contamination on [Sandia-controlled premises](#). The program document is administered by the Industrial Hygiene Program and it identifies how Sandia National Laboratories shall manage and control beryllium exposures.”



- **Change:** The former first sentence after the second bullet from “This document applies to activities on Sandia-controlled premises involving past and/or present exposure, or the potential for exposure to beryllium, and to the disposition and handling of beryllium articles” **to** “This document applies to activities on Sandia-controlled premises involving past and/or present exposure, or the potential for exposure to beryllium, and to the disposition and handling of beryllium articles and beryllium contaminated equipment and other items.”
- **Change:** The first sentence in the last paragraph of Applicability from “ Existing operational tasks that are within the scope of this CDBPP include the Z-Machine Facility located in Technical Area IV at SNL/NM as a beryllium activity\, but not meeting the definition of a regulated area” **to** “Existing operational tasks that are within the scope of this CDBPP are presented on the [Beryllium Information Site](#). These activities do not meet the definition of a regulated area.”
- **Change:** The third sentence in the last paragraph of Applicability from “While performing the update of the SNL site-wide beryllium inventory, several buildings/ areas have been identified as having removable contamination” **to** “While performing the update of the SNL site-wide beryllium inventory, several buildings/ areas were identified as having removable contamination.”
- **Delete:** The last sentence in the last paragraph of Applicability: “There are no planned operational tasks within the scope of the CBDPP other than any newly identified contaminated buildings/areas.”



[Section 19A](#), "Hazardous Waste Management"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- ***Delete:** Attachment 19A-2, “Managing Hazardous Waste at a Collection Area” and renumber the remaining attachments accordingly.



- In all sections where acute waste is referenced a link to the RCRA P-listed waste is included.

- ***Add:** new topic heading “Elementary Neutralization” with associated information.
- Under topic heading, “Beryllium Contaminated Waste”:
 - ***Move:** all requirements for this topic to *ES&H Manual*, Section 19F, “Other Waste.”

Note: the moving of the Beryllium requirements to *ES&H Manual*, Section 19F, “Other Waste” was reviewed by the *ES&H Manual* Committee and the General reviewers during the review period for Section 19F starting 02/23/2006. No comments were received for this change during this review period.

- Under topic heading, “Waste Accumulation-Generation”:
 - ***Delete:** requirements and guidance for collection areas.



- Under topic heading, “Management of Common Waste Streams”:

- ***Add:** requirements for the management of used oil.

- Under topic heading, “Satellite Accumulation Point (SAP)”:

- ***Add:** requirement for waste to be picked up by the hazardous waste management facility (HWMF).
- **Delete:** guidance for collection areas.

- Attachment 19A-1, “Managing Hazardous Waste At A Less-Than-90-Day Accumulation Area”:

- Under topic heading, “Contingency Plan”:

- ***Add:** requirement specifics for the types of contingency plans to be maintained at a 90-day accumulation area and the Sandia Emergency Operations Center (EOC).



ES&H Manual Glossary:

- ***Add:**

- Used oil
- Used oil generator
- Used oil aggregation point



**Administrative Changes Only
July 13, 2006**

Section 4B, "Electrical Safety Practices"

This section was revised to:

- **Change:** At SNL/NM, the Subject Matter Expert (SME) **from** Jeff Downs (NM) **to** Mark McNellis throughout the parent document and on the Direct Access Services (DAS) List.



**Administrative Changes Only
July 6, 2006**

Section 4C, "Lockout/Tagout (LOTO)"

This section was revised to:

- On the interim site:
 - **Delete:** LOTO graphic and hyperlink to "Click image to visit the website" for the *"user-friendly LOTO Web Environment."*
 - **Add:** Hyperlink to "Safety Engineering Program, LOTO Website."
 - **Delete:** LOTO graphic and hyperlink to "Click image to visit the website" for the *"ES&H Manual, Section 4C."*
 - **Add:** Hyperlink to "Section 4C" of the *ES&H Manual*.
 - **Change:** Hyperlink from "Click image to visit the website " to " Safety Engineering Program, LOTO Website."
- **Delete:** LOTO graphic above hyperlink to "LOTO Program Site."



- **Change:** The hyperlink to the LOTO website from “ LOTO Program Site” to “ Safety Engineering Program, LOTO Website.”
- **Change:** In the table of contents and the corresponding header, “Scope and Applicability” was changed to “Applicability and Scope.”
- **Change:** In the table of contents, the hyperlink to “Annual Lockout/Tagout (LOTO) roles and Responsibilities for Authorized Workers (LTO 220)” was updated.
- **Change:** The hyperlink to the LOTO website from “LOTO Program Site” to“ Safety Engineering Program, LOTO Website.”
- Under topic, “Roles and Responsibilities”:
 - **Change:** Remove hyperlink to “LTO230.”
- Under topic “References”:
 - **Change:** Hyperlink to “LOTO *User Web Interface*” was updated to “Safety Engineering Program, LOTO website.”

Section 6W, "Process Safety Management (PSM)"

This section was revised to:

- **Change:** Change the SME from “Jeff Downs” to “Kathleen Moore.”

Administrative Changes Only July 5, 2006

Chapter 15, "Emergency Preparedness and Management"

This section was revised to:

- **Change:** The Review Date in the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on June 18, 2006.

June 28, 2006

Section 1D, "Who Does What"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- Under the topic, "Recommended Positions":

- ***Change:** The subtopic, "Center ES&H Coordinators" to "ES&H Coordinators."
- ***Delete:** "Responsibilities of these coordinators are negotiated with each center director and the division ES&H coordinator, and vary from center to center. Typical responsibilities include:"
- ***Add:** Under ES&H Coordinators, the new subtopic, "Roles," with the following two paragraphs:
 - The role of the Division ES&H Coordinator is to assist management in implementing and assuring ES&H performance and compliance within the division. Division ES&H coordinators have primary accountability for the responsibilities of center and building ES&H coordinators. Division ES&H coordinators may serve more than one division.
 - The role of the Center ES&H Coordinator is to assist staff and management in ES&H performance and compliance. This coordinator also has an important role in the assurance of ES&H compliance as an active part of the Division Self-Assessment process.
- ***Add:** The subtopic, "Responsibilities and Accountabilities" and the following below:
 - "The Division ES&H Coordinator is responsible and accountable for":
 - "Assuring ES&H performance and compliance within the division."
 - "Leading and managing the division self-assessment process."
 - "Developing division-specific policies, processes and tools to assist staff and management in ES&H performance."
 - "Participating in [LIWG](#) to address division concerns and issues,

developing corporate solutions, and sharing lessons learned and best practices. Sponsor changes in corporate processes to meet the needs of the division.”

- “Acting as primary POC to DOE for issues and concerns with ES&H performance within the division, and providing input to decision made by the division VP.”
- “Leading and integrating the [Division ES&H Team](#) in the assurance of ES&H implementation.”
- “Assuring non-compliant operations are suspended until corrected.”
- “Reporting non-compliances to appropriate management.”
- “Overseeing all ES&H coordinators in their division, including working with management to determine the need for and/or the selection of center and building ES&H coordinators.”
- “Acting as the [facility manager/designee](#), where applicable.”
- “The Center ES&H Coordinator is responsible and accountable for”:
 - Serving as the interface and principal point of contact (POC) for ES&H information flow to and from their organization, “and coordinating ES&H audits/assessments of the center.”
 - “Providing technical assistance to staff and management in meeting ES&H requirements.”
 - “Communicating changes in requirements, lessons learned, and best practices to the staff and management.”
 - “Communicating problems and concerns from the staff and management to the division ES&H office, [LIWG](#), and appropriate external organizations.”
 - “Assuring that non-routine performance events within the center are adequately investigated, tracked, and corrected. When appropriate, assure that DOE reporting requirements are met.”
 - “Participating in the Division ES&H team, by acting as a communication tool to and from the team, participating in sub teams to develop division





standards and policies, and share lessons learned and best practices.”

- ***Change:** “Coordinating self-assessments and root cause analyses, reporting results, and ensuring corrective actions are tracked to closure”

to

“Coordinating self-assessments, root cause analyses, data gathering, reporting results, and ensuring corrective actions are tracked to closure.” in the bullet above the last, under “The Center ES&H Coordinator is responsible and accountable for”

- ***Delete:** The subtopic, “Division ES&H Coordinators.”
- ***Delete:** “Acting as a consultant by” and move bullets underneath up a level to align with preceding bullets.



- Attachment 1D-3 was revised to:

- In the table, in row 1:
 - ***Change:** “Pat Smith” and “Charles Hartwig,” to “Brian Damkroger” as the Chair of the Biological/Chemistry Safety Committee (SNL/CA) in column 2.
- In row 2:
 - ***Delete:** “Corporate” in the name of the “10300 ES&H Issues Management Review Committee” in column 1.
 - ***Change:** “Frank Alton” to “Heidi Herrera” as the Chair of the 10300 ES&H Issues Management Review Committee in column 2.




- In row 3:
 - ***Change:** “Jim Bartel” to “Stephanie Ball” as the Chair of the SNL/CA Institutional Biosafety Committee in column 2.
 - **Change:** “Approves recombinant DNA research activities and NIH proposed and funded work.” **to** “Reviews and approves recombinant DNA research activities covered by NIH guidelines, proposed work requiring Biosafety Level 2 containment, select agent work, and work with biohazardous agents for safe handling practices and compliance with ES&H-related requirements and policies.” In column 3.




- In row 4

- ***Change:** “SNL/NM Biosurety Review Committee” to “SNL/NM Institutional Biosafety Committee” in column 1.
- ***Change:** “Lisa Hooper” to “Grant Heffelfinger” as the Chair of the SNL/NM Institutional Biosafety Committee in column 2.
- ***Add:** After “Review,” “and approve recombinant research activities covered by NIH guidelines,” in column 3.

- In row 5 (new row):

- 
- ***Add :** “Construction Safety Standing Committee (CSSC)” in column 1.
 - ***Add :** “Gary Sanders” as the Chair of the Construction Safety Standing Committee in column 2.
 - ***Add:** “The Committee is a decision group that provides safety oversight of all construction and construction-like work at Sandia-controlled premises performed through contracts.” in column 3.
 - ***Delete:** The “Corporate Fire Protection Council” row.

- In row 6:

- 
- ***Change:** “Electrical Safety Committee (charter)” to “Electrical Safety Standing Committee (ESSC) in column 1.”
 - ***Change:** “J. Downs” to “Gilbert Herrera” as the Chair of the Electrical Safety Standing Committee (ESSC) in column 2.
 - ***Change:** “Provide technical resource for identifying, communicating, and recommending resolution of electrical safety issues.” **to** “Provide corporate oversight of line implementation of the electrical safety program including: regulatory compliance; tracking and trending of metrics, occurrence and non-compliance data; review and assessment of line implementation; and review of identified issues through audits or as identified by the Issues Management System. The committee functions as an advisory committee.” in column 3.

- In row 7:

- ***Change:** “Electrical Safety Committee” to “Electrical Safety Functional

Committee (ESFC).”

- In row 8:
 - ***Change:** “J. Rice” to “Thomas Blejwas” as the Chair of the Explosives Safety Committee in column 2.
- In row 9:
 - ***Change:** “B. Clevenger” to “Darrell Fong” as the Chair of the Hoisting and Rigging Safety Committee in column 2.
- In row 10:
 - ***Change:** “D. R. Charlesworth” to “Michael Hazen” as the Chair of the Joint Firearms Safety Committee in column 2.
- In row 11:
 - **Change:** “R. Shrouf” to “Roger Shrouf” as the Chair of the Pressure Safety Committee.
 - ***Delete:** The “Pulsed Power Safety Committee (PPSC)” row in its entirety.
- In row 13:
 - ***Change:** “J. K. Rice” to “Thomas Blejwas” as the Chair of the Sandia Nuclear Facilities Safety Committee (NFSC) in column 2.
- In row 14:
 - **Change:** “A. Medina” to “Anthony Medina” as the Chair of the Sandia Radiation Protection Safety Committee (RPSC) in column 2.
- In row 16:
 - ***Change:** “Ed Williams” to “Darrell Fong” as the Chair of the Traffic Safety Committee in column 2.
- In row 17:
 - ***Change:** “J. Vaughan” to “Darrell Fong” as the Chair of the Union Management Safety Committee (SNL/CA).



- ***Add:** Attachment 1D-5, "Required Training for All ES&H Coordinators," with tables listing course names, frequency, and length.

Section 6E, "Laboratory Standard - Chemical Hygiene Plan"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Add:** A review date to the header to indicate that an ES&H Manual Self-Assessment (SA) checklist was completed on this supplement.
- Under topic, "Applicability":
 - **Add:** "Chemical Information System" under "Exemptions."
 - **Delete:** "Interim Storage Site" under "Exemptions" (at SNL/NM).
- Under topic, "Training":
 - ***Add:** Another work activity, "Any site-specific activity involving potential exposure of laboratory workers to hazardous chemicals under normal operating conditions or in foreseeable emergencies" with recommended training LAB 103.
 - ***Delete:** the following statement under "Managers shall be responsible for ensuring that" under "Members of the Workforce using hazardous chemicals are informed of the following":
 - "Physical hazards and health hazards of the chemicals present in their work area."
 - ***Add:** the following statement under "Managers shall be responsible for ensuring that":
 - "Members of the Workforce using hazardous chemicals receive training on:
 - The physical hazards and health hazards of the chemicals present in their work area.
 - The methods and observations that may be used to detect the presence or release of hazardous chemicals (continuous air monitoring, visual appearance or odor).

- The measures that can be taken to protect themselves from these hazards (appropriate work practices, emergency procedures, and personal protective equipment).”
- ***Add:** new topic section and corresponding requirements entitled, “ Contacting Industrial Hygienists.”
- Under topic, “Occupational Exposure to Hazardous Chemicals in Laboratories”:



- ***Add:** “Under “Managers of Members of the Workforce who engage in the laboratory use of hazardous chemicals shall be responsible for ensuring that”: the statement ”See ‘Contacting Industrial Hygienists’” after the following bulleted items:
 - “Physical hazards and health hazards associated with hazardous chemicals used in laboratory operations have been identified, evaluated, and controlled.”
 - “Managers shall implement control measures based on hazard evaluations, which may include monitoring and/or consultation with their Division Industrial Hygienist.”
 - “Exposure monitoring for beryllium and OSHA-regulated substances are initiated if there is reason to believe exposure levels for that substance routinely exceed the action level (or the OSHA PEL or ACGIH TLV in the absence of an action level).”



- ***Add:** the words “DOE Action Levels (beryllium)” to the second bulleted item.
- ***Change:** “Under “Managers of Members of the Workforce who engage in the laboratory use of hazardous chemicals shall be responsible for ensuring that”: “”Division ES&H Team” to “Division Industrial Hygienist” in the following bulleted item:
 - “Managers shall implement control measures based on hazard evaluations, which may include monitoring and/or consultation with their Division ES&H Team.”
- ***Delete:** “Under “Managers of Members of the Workforce who engage in the laboratory use of hazardous chemicals shall be responsible for ensuring that”: the words “determine and” in the following bulleted item:



- “Managers shall determine and implement control measures based on hazard

evaluations, which may include monitoring and/or consultation with their Division ES&H Team.”

- ***Delete:** “Under “Managers of Members of the Workforce who engage in the laboratory use of hazardous chemicals shall be responsible for ensuring that”: the words “cognizant Members of the Workforce and/or” in the following bulleted item:
 - “They review and approve laboratory operations, procedures, or activities whenever a new chemical or change in process is introduced which creates a potential health hazard to Members of the Workforce and which has not been evaluated by cognizant Members of the Workforce and/or their Division ES&H Team.”

- **Delete:** Under “Guidance”: the following bulleted items:

- “Determining whether exposures to hazardous chemicals routinely exceed the OSHA action level (or in the absence of an action level, the PEL or ACGIH TLVs).
- Determining appropriate control measures to reduce potential exposure to hazardous chemicals.
- Determining whether exposure monitoring and medical consultation is required.”

- **Add:** Under “Guidance”: to the bulleted item “Reviewing laboratory operations, procedures, or activities whenever a new chemical or change in process is introduced which creates a potential health hazard to Members of the Workforce” the following: “and which may require contacting the Industrial Hygienist supporting the Division (see ‘Contacting Industrial Hygienists’).”

- Under topic, “Technical Work Documents”:

- **Add:** Under “Guidance” in the first bulleted item, the words “associated with the work activity.”
- **Add:** Under “Guidance” in the third bulleted item, the following additional wording: “as long as the reasonably anticipated hazards and controls associated with the work activity are addressed in the adopted document. TWDs may also be used in conjunction with other TWDs that address other hazards (e.g., biological agents, physical agents). “
- **Delete:** Note regarding Attachment 6E-1.



- Under topic, “Particularly Hazardous Chemicals”:

- ***Add:** to the first paragraph under “Requirements” the following wording, “there are provisions for additional protection” and “particularly hazardous substances.”
- ***Delete:** the word “which” before “include select carcinogens.”
- ***Change:** definition of “acute toxicity” in ES&H Manual Glossary.
- ***Add:** the wording “Specific consideration shall be given to the following provisions, where appropriate.”

- Under topic, “References”:

- ***Move:** from “Requirements Source Documents” to “Implementing Documents”:
- 29 CFR 1910.1200, Hazard Communication.
- ***Move:** from “Requirements Source Documents” to “Related Documents”:
- American Conference of Governmental Industrial Hygienists (ACGIH), 1997 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, Cincinnati, OH, latest edition.
- **Add:** to “Implementing Documents”:
- 29 CFR 1910 Subpart Z, Toxic and Hazardous Substances.
 - 40 CFR 700-789, TSCA Implementing Regulations.
- ***Delete:** Attachment 6E-1, “Sample Standard Operating Procedure (SOP) for Working with Hazardous Chemicals.”



Section 6K, "Hazardous Waste Operations and Emergency Response"

Note: Over 75% of this section is either new or has changed and should be read in its entirety.

This section was revised to:

- **Add:** “Review Date: June 19, 2006” to the header to indicate that an *ES&H Manual Self-*

Assessment (SA) was completed on this section.



Section 6N, "Biological Agents and Biosafety"


Note: This section 6N, "Biological Agents and Biosafety," was substantively changed based upon OA (DOE) findings.


This section was revised to:

- ***Add:** "Review Date: June 14, 2006," was added to the header to indicate an *ES&H Manual* Self-Assessment was completed on this section.
- ***Change:** The Biological Agents and Biosafety contact was changed in the parent document, throughout all attachments, and on the Direct Access Services List from Lisa Hooper to Lynn Fondren.
- ***Change:** At SNL/NM, the Responsible Facility Officer (RFO) was changed from Lisa Hooper (NM) to Lynn Fondren (NM) and the Alternate Responsible Facility Officer was changed from Matt Custer (NM) to Lisa Hooper. At SNL/CA, the RFO was changed from Len Napolitano to Glenn Kubiak and the Alternate RFO was changed from Duane Lindner to Susan Weekly in the parent document, throughout all attachments, and on the Direct Services List.
- ***Change:** DOE/AL SD 450.7 is not in Sandia's legal contract, therefore the legal driver, "D – DOE/AL SD 450.7," was changed to "DOE N 450.7" throughout the parent document.
- ***Delete:** Reference to "Biosurety Committee Review" was omitted from the parent document.
- **Change:** Throughout the document, the word "not" was changed to bold font style to provide emphasis.
- **Change:** Throughout the parent document and all attachments the word "personnel" was replaced with "Members of the Workforce."
- Under topic, "Applicability":
 - ***Change:** "Contact the Biological Safety Officer" was changed to "Contact the Biological Safety Officer (BSO)," based on regulatory requirements for oversight permits, and registration requirements.

- **Add:** Hyperlinks to the *ES&H Manual Glossary* were added for “Biosafety Level 1” and “Biosafety Level 2” agents.

- Under topic, “Microorganisms and Biological Toxins”:

- 
- ***Delete:** “Managers should contact the appropriate Division ES&H Team Industrial Hygienist for guidance when work involves microorganisms or biological toxins” was moved to the requirements section of this section as follows, “Managers shall contact the appropriate Division ES&H Team Industrial Hygienist for guidance when work involves microorganisms or biological toxins.”
 - **Change:** In the third bullet, the requirement was clarified from “42 CFR 72, *Interstate Shipment of Etiological Agents*. (Applicable to work with select agents and the packaging, labeling, and transport of etiological agents)” to read, “42 CFR Parts 72 and 73, *Possession, Use, and Transfer of Select Agents and Toxins*, 7 CFR Part 331, and 9 CFR Part 121, *Possession, Use, and Transfer of Biological Agents and Toxins* (applicable to registration, receipt, transfer, disposal handling, security and accounting for select agents).”
 - **Change:** In the last bullet, the hyperlink to NIH Guidelines for Research Involving Recombinant DNA Molecules was updated and the word “research” was capitalized.
 - ***Change:** The legal CPR001.3.1 specifies that only the Legal Division can perform an interpretation. Therefore, the note under requirements in this section (and subsequent sections) was changed from, “The Biological Safety Officer will, upon request assist managers in interpreting applicable regulations and guidelines” to “The BSO shall, upon request, assist managers in interpreting applicable regulations and guidance.”
 - **Change:** Header was changed from “NEPA,” to “National Environmental Policy Act (NEPA).”
 - ***Clarify:** Under header, “Termination of Use,” related requirements pertaining to Section 19F were changed from “Section 19F, “ for information on infectious waste” to ” Section 19F, “Other Wastes,” for requirements related to the disposal of infectious waste.” Further, a link was added for readers to access “Section 19F.”



- Under topic, “Select Agents”:

- ***Change:** The hyperlink to “select agents” was redirected from the *ES&H Manual* to the list provided by HHS and USDA.

- ***Change:** First sub-bullet under header, “Registration of Facilities,” was changed from “ The Centers for Disease Control and Prevention (CDC) as being equipped and capable of handling the specific select agent at the appropriate biosafety level” to “The Centers for Disease Control and Prevention (CDC) or with the United States Department of Agriculture - Animal and Plant Health Inspection Services (USDA/APHIS) being equipped and capable of handling the specific select agent at the appropriate biosafety level.”

- ***Change:** The note under header, “Registration of Facilities,” was changed from “ The Responsible Facility Official (RFO) will be the primary point of contact with the CDC when seeking CDC registration or amending an existing CDC registration” to “The Responsible Facility Official (RFO) shall be the primary point of contact with the CDC when seeking CDC registration or amending an existing CDC registration.”

- ***Clarify:** Requirements were changed from “Proposed laboratories/facilities are registered with:” to “Proposed laboratories and/or facilities are registered with:” to add clarity.

- Under topic, “Plant and Animal Pathogens”:

- ***Change:** “Members of the Workforce should contact the appropriate Division ES&H Team for guidance when working with plant or animal pathogens” was changed to the following requirement, “Members of the Workforce shall contact the appropriate Division ES&H Team for guidance when working with plant or animal pathogens.”

- Under topic, “Recombinant DNA Molecules”:

- ***Add:** **Note** : If work with recombinant DNA molecules is exempt from the NIH Guidelines and the work does not involve BSL-2 organisms, the BSO will review or delegate to Division IH for review.

- Under topic, “Plant and Animal Pathogens”:

- ***Change:** Guidance was changed from, “Members of the workforce should contact the appropriate Division ES&H Team for guidance when working with plant or animal pathogens” to a requirement as follows, “Members of the workforce shall contact the appropriate Division ES&H Team for guidance when working with plant or animal pathogens.”

- Under topic, “Biosafety/Operations Manual”:

- **Change:** In the first bullet, change “technical work document” to “technical work document (TWD).”
- ***Add:** “ **Note** : If work is conducted within a BSL-2 facility, then the IH shall conduct the initial review and internally refer to BSO for additional review” was added based on requirements .
- **Clarify:** Header and subsequent text was changed from, “Nonpathogenic/Avirulent Agents,” to “Nonpathogenic or Avirulent Agents.
- **Change:** “BSL2” was changed to “BSL-2.”



- Under topic, “Related Hazards and Activities”:

- ***Change:** The last line on the “Related Hazards and Activities,” table was changed from “Waste disposal Chapter 19, “Waste Management,” to “Infectious waste Section 19F, “Other Waste.”
- **Change:** References to Chapter 16 were corrected from, “Chapter 16, Benefits and Health Services” to read, “Chapter 16, “Health, Benefits, and Employee Services.”
- **Change :** A typo was corrected within the table to change “Section 10C, “Migratory Birds and Protected Species” to “Section 10C, “Migratory Birds and Protected Species, and Other Biota.”

- Under topic, “References”:



- ***Add:** 42 CFR Parts 72 and 73, *Possession, Use, and Transfer of Select Agents and Toxins.*
- ***Add:** 7 CFR Part 331 and 9 CFR Part 121, Possession, Use, and Transfer of Biological Agents and Toxins.
- ***Change:** The following Required Source Document, “DOE/AL SD 450.7, *The Safe Handling, Transferring, and Receiving of Etiologic Agents Albuquerque Operations (AL) Contractor Facilities (“Al Biosurety Program”)* was changed to “DOE 450.7, 450.7, *The Safe Handling, Transfer, and Receipt of Biological Etiological Agents at Department of Energy Facilities.* ”

Section 6S, "Toxic Substances Control Act (TSCA)"



Note: Over 75% of this section is either new or has been substantively changed and should therefore be read in its entirety.

This section was revised to:

- *** Add:** “Review Date: June 13, 2006,” was added to the header to indicate an ES&H Manual Self-Assessment was completed on this section.
- ***Change:** In the header, the Toxic Substances Control Act (TSCA) contact was changed in the parent document and on the Direct Access Services List from Jeff Downs to Katie Moore.
- ***Change:** The California counterpart was changed in the parent document and on the Direct Access Services List from Mark Brynildson to Daniel Kuey.
- ***Delete:** Attachment 6S-1 Examples of TSCA-Regulated Chemical Substances was removed from this section.
- ***Add:** The topic, “Toxic Substances Control Act (TSCA) Compliance With Topics 8C and 8E was added to this section.
- **Change:** Throughout the document, the word “not” was changed to bold font style to provide emphasis.
- Under topic, “Applicability”:
 - ***Delete:** “This includes activities that result in the manufacture, processing, use, distribution, disposal, import, or export of such chemical substances” was omitted.
 - ***Delete:** The following note: “It is Sandia’s position that because Sandia consists of non-commercial facilities that do not manufacture or process chemical substances for commercial purposes, Sections 5 and 8 of CFR, Subchapter R, Toxic Substances Control Act (TSCA), do not apply to SNL. However, SNL must comply with TSCA Sections 4, 6, 12, and 13.” was omitted from this topic.
- Under topic, “General Toxic Substances Control Act (TSCA) Compliance Topics”:
 - ***Add:** The legal driver for requirements in this section (TSCA Sections 4 – 8, 12, and 13) was added.
 - ***Add:** Background information pertaining to the legal drivers encompassing requirements was provided indicating, “The Toxic Substance Control Act (TSCA), 15 USC Section 2601 *et seq.*, gives the Environmental Protection Agency (EPA)



comprehensive authority to regulate the manufacture, use distribution in commerce, and disposal of chemical substances. Under the TSCA, the EPA is required to compile, keep current, and publish a TSCA inventory of chemical substances being manufactured, imported and processed in the United States. This TSCA inventory is considered to be the list of existing chemicals. If a chemical is **not** listed on the TSCA Inventory, it is considered to be a new chemical substance. Sandia consists of non-commercial facilities that do **not** manufacture or process chemical substances for commercial purposes. Citations provided correlate with the Title I sections of the Act for ease in transmitting the requirements. Accordingly, Members of the Workforce (MOW) shall comply with the following TSCA Sections:

- TSCA Sections 4, 6, 12, and 13.
- TSCA Sections 8C and 8E because it is consistent with good management and worker protection.



Note: Sandia is exempt from TSCA Section 5 and 8 except for Section 8C and 8E.

Note: TSCA Section 4 addresses testing requirements for specific chemicals. TSCA Section 6 applies to Polychlorinated Biphenyls (PCBs) and is **not** included in this section of the ES&H Manual. See Section 10D, "Polychlorinated Biphenyl (PCB) Management."

TSCA Section 8C addresses keeping records of significant adverse reactions to health and the environment allegedly caused by a chemical substance and TSCA Section 8E involves reporting to EPA if a pattern of health effects are observed for new chemical substances or if health effects which have **not** previously been identified for known chemicals are observed.



TSCA Section 12 requires Export notifications to inform foreign governments of shipments of chemical substances. TSCA Section 13 requires Import certification to ensure that all chemical substances imported into the United States comply with TSCA.

MOW may work with new chemical substances as part of research and development activities for non-commercial use. Because these new chemical substances have unknown toxicity, Managers of MOW handling new chemical substances shall do the following:

- Ensure that Technical Work Documents (TWDs) (e.g. SOPs) which include good laboratory practices and requirements for

implementing the highest level of protection when handling new chemical substances are developed and followed.



- Inform MOW of the fact that health and environmental hazards are unknown for new chemical substances.
- Inform MOW to report to Medical or to the TSCA subject matter expert (SME) any significant adverse health effects believed to be caused from new chemical substances.
- Inform MOW to report to the Environmental Protection or to the TSCA subject matter expert any significant adverse environmental effect is believed to be caused by new chemical substances. Some new chemical substances may be regulated by the Toxic Substances Control Act (TSCA) for import and/or export. MOW shall provide information about these of chemical substances to the TSCA subject matter expert or the Import/Export Control Office when requested.”



- **Change:** The guidance material was changed from, “ Members of the Workforce should contact their Division ES&H Team or the TSCA contact for guidance in working with TSCA-regulated substances” to “Members of the Workforce (MOW) should contact the IH on the Division ES&H Team or the TSCA contact for guidance on working with TSCA-regulated substances.”

- **Delete:** The following notes were omitted from the guidance, “Members of the Workforce may view current lists of TSCA-regulated chemical substances using Microsoft ® Excel ® as follows:

1. Go to the EPA's CORR database on the worldwide web.
2. Choose the CORR.EXE file by double clicking on the name. This will bring up a "Save As" screen.
3. In the "Save In" area, scroll the location where you want to save the CORR. EXE file. The default directory is "C:\Temp."
4. Click on the word "Save."
5. Go to or start your "File Manager" or "Explore" in Windows 95 ® and Windows NT 4.01 ®.
6. Locate the CORR.EXE file that you saved in Step 4.



7. Double click on the filename CORR.EXE. This initiates an automatic expansion of the file.”

- Under topic, “Toxic Substance Control Act (TSCA) Compliance With 8C and 8E Topics”:
 - ***Add:** The legal driver for requirements in this section (TSCA Section 4 – 8, 12, and 13) was added.
 - ***Add:** The entire text for this topic is new and should be read in its entirety.
- Under topic, “Cooperative Research and Development Agreements (CRADAs) and Work for Others (WFO) Agreements”:
 - ***Add:** The legal drivers for requirements in this section (*TSCA Sections 4, 8C, 8E, 12, and 13*) were added.
 - ***Change:** The requirements under this topic were revised from, “ SNL principal investigators working on a Cooperative Research and Development Agreement (CRADA), Work for Others (WFO) agreement, or other research agreement with non-SNL partners, in which new chemical substances are developed or a significant new use of an existing chemical substance is planned, shall:
 - Work with the research partner(s) to identify and document Toxic Substances Control Act (TSCA) responsibilities in the written agreement.
 - Work with the research partner(s) to determine who will be responsible for TSCA notification requirements before manufacturing or using the chemical substance”

to the following: “If work is conducted on a Cooperative Research and Development Agreement (CRADA), Work for Others (WFO) agreement, or other research agreement with non-SNL partners, in which new chemical substances are developed or a significant new use of an existing chemical substance is planned, the Sandia Corporate Contracts & Policy Management Department shall:

 - Include in the prime contract, Part II - Contract Clauses - Section I, a statement that Sandia must **not** perform ‘work for others’ activities that would place it in direct competition with the domestic private sector.
 - Work with the research partner(s) to identify and document Toxic Substances Control Act (TSCA) responsibilities in the written agreement or legal contract.

- Explain how TSCA liabilities are addressed through legal contracts.”

- ***Change:** The notes provided for the requirements of this topic were changed from, “Because SNL typically does not receive commercial advantage for its research work, TSCA compliance in such instances should be the responsibility of the non-SNL research partner” to the following:

“SNL typically does **not** receive commercial advantage for conducting research work therefore TSCA compliance in such instances shall be the responsibility of the non-SNL research partner” to add clarity.



- Under topic, “Toxic Substances Control Act (TSCA) Exports”:

- ***Add:** The legal driver (TSCA Section 12) for requirements in this section was added.
- ***Add:** “Certain chemicals and mixtures identified in TSCA Section 12B require Export Notification to the Environmental Protection Agency (EPA). SNL International and Domestic Security Contracts and the Import/Export Control Office are the lead contacts for TSCA import and export compliance,” was added to the requirement.

- ***Change:** The requirement was changed from, “ Chemical owners or principal investigators who plan to import a chemical substance from outside the customs territory of the United States without using Just-In-Time (JIT) shall: Notify the TSCA contact that a chemical substance will be imported. Purchase the imported chemical substance through the appropriate SNL buyer” to the following:

“SNL International and Domestic Security Contracts and the Import/Export Control Office are the lead contacts for TSCA import and export compliance. Chemical owners or principal investigators shall do the following when planning to export a chemical substance out of the customs territory of the United States: Complete a Notice of Export for Chemical Substances form (SF 2001-NEC) and forward the completed form to the TSCA contact at least seven days prior to intended export. Call the Import/Export Control Office in Department 10245 if there are any questions.”

- Under topic, “Toxic Substances Control Act (TSCA) Imports”:

- ***Add:** The legal driver (TSCA Section 12) for requirements in this section was added.
- ***Change:** The original requirements, “ Chemical owners or principal investigators



who plan to import a chemical substance from outside the customs territory of the United States without using Just-In-Time (JIT) shall: Notify the TSCA contact that a chemical substance will be imported. Purchase the imported chemical substance through the appropriate SNL buyer. Note: For all chemical purchases through JIT, the JIT vendor is responsible for filing the necessary TSCA paper work on SNL's behalf. See the Chemical Inventory System (CIS) for information about coding requirements” were substantively changed.”

- ***Add:** New requirements were added to this topic in accordance with TSCA to indicate, “Members of the Workforce (MOW) who import a chemical substance shall comply with Toxic Substances Control Act (TSCA) Section 13 and certify the status of all imported chemicals. The certification shall be expressed as either a negative or positive statement as follows: Negative Certification. Importers of chemicals **not** subject to TSCA must certify that compliance with TSCA is **not** required. Importers must certify this by signing the following negative certification statement: “I certify that all chemicals in this shipment are **not** subject to TSCA.” Positive Certification. Importers of chemicals subject to TSCA must certify that compliance with TSCA has been determined. Importers must certify this by signing the following positive certification statement: “I certify that all chemicals in this shipment comply with all applicable rules or orders under TSCA and that I am **not** offering a chemical substance for entry in violation of TSCA or any applicable rule or order under TSCA.”
- ***Add:** A note was added to this topic, “Chemicals shall **not** be purchased on P-Cards. See CPR 500.2.1, Procurement Manual.”
- ***Add:** In the last paragraph, additional requirements were added in accordance with TSCA, “Sandia International and Domestic Security Contracts and the Import/Export Control Office are the primary contacts for TSCA import compliance. Chemical owners or principal investigators who plan to import a chemical substance into the customs territory of the United States without using JIT shall purchase the imported chemical substance through the appropriate SNL International buyer.
- As arranged by the International buyer, SNL can either act as the Importer of Record or use a Custom Broker: If SNL is the Importer of Record, then the SNL Buyer shall obtain the TSCA certification statement from the sender. If SNL uses a Custom Broker, then the Custom Broker shall obtain the TSCA certification from the sender. If no TSCA certification is available with the shipping documentation, then the Sandia Buyer or the Custom Broker shall contact the sender to obtain the TSCA certification and provide a copy of that TSCA certification to the Import/Export Control Office. The sender is responsible for providing the proper TSCA certification. If certification is **not** able to be obtained from these sources, then the



Import/Export Control Office shall ask the TSCA subject matter expert (SME) to determine the TSCA requirements for the chemical substance or return the chemical to the sender.”

- ***Delete:** The following after the last bullet: “For all chemical purchases through JIT, the JIT vendor is responsible for filing the necessary TSCA paper work on SNL’s behalf. See the Chemical Inventory System (CIS) for information about coding requirements.
- **Add:** Under guidance, “Chemical purchases should be made through Just-In-Time (JIT) if possible. The JIT vendor is responsible for filing the necessary paper work on the behalf of SNL.”

● Under topic, “References”:

- **Add:** *15 USC, 2601 *et seq.*

June 26, 2006

Section 4L, "Personal Protective Equipment (PPE)"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Change:** the CA Counterpart from Herman Armijo to Jay Larsen throughout the parent document and all associated attachments.

● Under topic, “General Requirements”:

- ***Add:** under Requirements, after the bullet which states “A workplace assessment is performed through a written certification to determine if hazards are present, or likely to be present, that necessitate the use of PPE,” add the following sentence “The division ES&H Team shall be contacted for guidance during this process.”
- ***Move:** the last bullet under guidance which states “Contact their Division ES&H Team if they do not understand how to properly use PPE,” to the Requirements section under “Members of the Workforce who use PPE shall.”

- Under topic, “Hand Protection”:



- ***Delete:** the heading “Guidance” to make the last sentence under this topic fall under “Requirements.”
- ***Change:** the last sentence from “Members of the Workforce should consult the relevant material safety data sheet (MSDS), SNL Chemical Information System (CIS), and/or Division ES&H Team to select appropriate hand protection” **to** “Members of the Workforce shall consult the relevant material safety data sheet (MSDS), SNL Chemical Information System (CIS), and/or Division ES&H Team to select appropriate hand protection.”
- Under topic, “Protective Clothing”:
 - ***Delete:** the heading “Guidance” to make the last sentence under this topic fall under “Requirements.”
 - ***Change:** the last sentence from “Members of the Workforce should consult the relevant material safety data sheet (MSDS) and/or their Division ES&H Team to select appropriate protective clothing” **to** “Members of the Workforce shall consult the relevant material safety data sheet (MSDS) and/or their Division ES&H Team to select appropriate protective clothing.”
- Under topic, “Related Hazards and Activities”:
 - **Change:** the reference for “PPE for electrical hazards” from “MN471004, Electrical Safety Manual, Chapter 2, General Requirements” **to** “Section 4B, Electrical Safety Practices.”



Section 4S, "Use of Powered Carts"

Note:(*) asterisk denotes substantive change.

This section was revised to:



- **Change:** The subject matter expert (SME) from Miriam Minton to Willie J. Johns, throughout the parent document and all associated attachments.
- ***Add:** New topic section and corresponding requirements entitled, "Responsibilities."
- Under topic, “Applicability”:
 - ***Delete:** The statement, “This section does not apply to the operation of Mitsubishi Mighty Mits trucks.”

- Under topic, “Areas of Operation”:



- ***Add:** Specifics that state Sandia/NM drivers shall operate any type of cart (gasoline or battery-powered) only in the specified areas.
- ***Change:** The requirement for Sandia/NM drivers, to only operate carts, “between Technical Areas I, II, and IV and Building 996, using 9th Street” to “operate between Technical Areas I, II, and IV, using 9th Street.”
- **Change:** Motor Pool to Fleet Services, throughout the parent document and all associated attachments.
- ***Change:** Requirement for Sandia/NM drivers to only operate carts “on H Street across Wyoming Boulevard to the Air Force Gas Station on 1st Street, but only during the hours 8:30 to 11:30 a.m. and 1:30 to 3:30 p.m.” to “on H Street across Wyoming Boulevard to the Air Force Gas Station on 1st Street, but only during the hours 8:30 to 11:30 a.m. and 1:30 to 3:30 p.m. Monday through Friday .”



- ***Change:** requirement for Sandia/NM drivers to only operate carts “on K Street between 14 Street and 20th Street , but not on 20th Street ” to “on K Street between 14 Street and 20th Street .”
- ***Delete:** Coronado Club from the requirement that specifies the areas where Sandia/NM drivers shall not drive carts.
- ***Add:** Note that states GEM carts travel at speeds of up to 25 MPH. By City of Albuquerque and New Mexico state law, these vehicles may only be used on roadways where the posted speed limit is 35 MPH or less. Since the speed limit on Eubank is 40 MPH, these carts are not allowed outside the Eubank Gate (see the GEM cart website: <http://www.gemcar.com/> for more information).

- Under topic, “Gasoline and Refueling”:



- ***Add:** Specifics that state, “use the black chip or the Sandia National Laboratories Fleet Services fuel cards” to the requirement for Sandia/NM drivers when refueling gasoline-powered carts.

- Under topic, “Maintenance”:

- ***Change:** The requirement for Sandia/NM drivers to “obtain approval from Fleet Services prior to any modifications to carts that may affect the performance or center of gravity of the vehicle” to “obtain approval from Fleet Services prior to any modifications to carts

Section 6D, "Hazard Communication Standard"

Note: (*) asterisk denotes substantive change.



This section was revised to:

- **Add:** "Review Date: June 12, 2006" to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- ***Add:** new topic and corresponding requirements entitled, "Contacting Industrial Hygienists."
- Under topic, "Applicability":
 - **Delete:** the following subordinate bullet from under the bullet titled "Treatment, storage, and disposal (TSD) facilities":
 - Interim Storage Site
 - **Add:** the following subordinate bullet under the bullet titled "Interim Storage Site":
 - Chemical Information System
- Under topic, "Training":
 - **Add:** the statement, "Corrosive materials include acids, bases, caustics, or alkaline compounds." to the work activity with recommended training HAZ208.
 - **Change:** the fifth bullet to include, after "...chemical inventory," the following statement in parentheses: "(see Chemical Information System [CIS] for site-specific lists of hazardous chemicals)."
 - ***Add:** the following requirement with associated subordinate bullets: "Managers shall ensure that Members of the Workforce who use hazardous chemicals are provided with the following site-specific training:
 - Methods and observations that may be used to detect the presence or release of a hazardous chemical in their work area (continuous air monitoring, visual appearance or odor of hazardous chemicals).
 - The physical hazards and health hazards of the chemicals in the work area.



- The measures Members of the Workforce can take to protect themselves from hazardous chemicals (appropriate work practices, emergency procedures, and personal protective equipment).”
- Under topic, “Control of Hazardous Chemicals” and under Guidance:
 - **Delete:** the following: “Managers should contact their Division ES&H Team for assistance with the following:
 - Determining exposures to air contaminant concentrations and the applicability of OSHA Permissible Exposure Limits (PELs) and ACGIH Threshold Limit Values (TLVs).
 - Determining appropriate control measures to reduce potential Members of the Workforce exposure to hazardous chemicals.
 - Identifying, evaluating, and controlling [physical hazards](#) and [health hazards](#) associated with hazardous chemicals.
 - Determining the applicability of [OSHA-regulated substances](#) (see in [29 CFR 1910](#), Subpart Z, *Toxic and Hazardous Substances*, and [10 CFR 850](#), *Chronic Beryllium Disease Prevention Program*, as tailored to SNL in [Section 6Z Chronic Beryllium Disease Prevention Program](#).”
 - **Change:** the second sentence in the last paragraph from “...building modification and hazard assessment (BMHA) process ...” **to** “...Facilities Management and Operations Center (FMOC) Job Site Hazard Evaluation (JSHE) process...”
- Under topic, “Related Hazards and Activities”:
 - **Add:** “Asbestos” under “Hazard/Activity” and “Section 6B, “Asbestos” under “Reference.”
 - **Add:** “Beryllium” under “Hazard/Activity” and “Section 6Z, “Chronic Beryllium Disease Prevention Program” under “Reference.”
- Under topic, “References”:
 - **Add:** to “Implementing Documents”:
 - “40 CFR 700-789, TSCA Implementing Regulations.”



- **Delete:** from “Implementing Documents”:
 - SNL, Section 6Z, Chronic Beryllium Disease Prevention Program.
- ***Move:** (from “Requirements Source Documents” to “Implementing Documents”):
 - 29 CFR 1910 Subpart Z, “Hazardous and Toxic and Hazardous Substances.”
 - 29 CFR 1910.120, “Hazardous Waste Operations and Emergency Response.”
 - 29 CFR 1910.1450, “Occupational Exposure to Hazardous Chemicals in Laboratories.”
- ***Move:** (from “Requirements Source Documents” to “Related Documents”):
 - “American Conference of Governmental Industrial Hygienists (ACGIH), 1997 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, Cincinnati, OH, latest edition.”
- Under topic, “Attachment 6D-1”:
 - ***Change:** (under the heading “Resources for Hazard Determination,” and under Requirements):
 - “their division ES&H Team” **to** “the industrial hygienist supporting their division.”
 - **Change:** (under the heading “MSDSs for Manufactured, Distributed, or Imported Hazardous Chemicals,” and under Guidance):
 - “their division ES&H Team” **to** “the industrial hygienist supporting their division.”

Section 6P, “Local Exhaust Ventilation (LEV)”

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Change:** the subject matter expert (SME) from Mark Wong to Chad Hjorth throughout the parent document and all associated attachments.



- Under topic, “Determination of Need for Local Exhaust Ventilation (LEV) Equipment”:
 - ***Move:** the following statement and subordinate bullets from Guidance to Requirements and change the “should” to “shall”: “Members of the Workforce shall contact the Division ES&H Team for guidance during this process (per the Occupational Exposure Assessment Process) in order to receive assistance in:
 - Determining the best type of exposure control, which may include LEV.
 - Assessing whether existing LEV is adequate to control potential hazards from new, modified, or unevaluated operations.”

- Under topic, “Installation/Removal of Local Exhaust Ventilation (LEV) Equipment”:

- ***Move:** the statement “Managers should notify the LEV Program contact of the installation or removal of LEV equipment,” from Guidance to Requirements and change the “should” to “shall.”
- ***Add:** the following statement under Requirements (at the end): “Managers shall consult the appropriate Division ES&H Team member to reinforce the requirements listed above.”
- ***Move:** the following statement and subordinate bullets from Guidance to Requirements and change the “should” to “shall”: “Members of the Workforce shall consult the appropriate Division ES&H Team member when:
 - They have questions regarding LEV equipment.
 - Air emission control devices are being considered.
 - Material exhausted presents an environmental concern.”

- Under topic, “Use of Local Exhaust Ventilation (LEV) Equipment”:

- ***Change:** the second sentence in the second bullet under Requirements from “Managers should consult the appropriate Division ES&H Team member for guidance on performance of validation or applicable operability validation frequency” **to** “Managers shall consult the appropriate Division ES&H Team member for guidance on performance of validation or applicable operability validation frequency.”
- ***Change:** the last sentence in the second note under Requirements from “Consult the appropriate Division ES&H Team member for guidance” **to** “Managers shall

consult the appropriate Division ES&H Team member for guidance.”

- ***Change:** the last sentence in the fifth bullet under Requirements from “See the Division ES&H Team member for more information” to “Managers shall consult the appropriate Division ES&H Team member for more information.”
- ***Change:** the last sentence in the third note under Requirements from “Consult the appropriate Division ES&H Support Team member or Attachment 6P-1, "Air-Flow Indicators" for additional guidance” to “Managers shall consult the appropriate Division ES&H Support Team member or Attachment 6P-1, "Air-Flow Indicators" for additional guidance.”
- ***Move:** the following “Operability Validations” information from Guidance to Requirements and change the “should” to “shall”:

- Managers shall consult the appropriate Division ES&H Team member for assistance with annual operability validation of LEV equipment and to obtain the following services:



- Face velocity or capture velocity measurements
- Visible smoke capture tests, such as smoke, dry ice, and carbon dioxide fogger
- Function checks for newly installed airflow indicators
- Attachment of operability validation labels to LEV equipment that passes performance tests

- ***Move:** the following “Effectiveness of Equipment” information from Guidance to Requirements and change the “should” to “shall”:

- Managers shall consult the appropriate Division ES&H Team member when:

- LEV equipment used to control radioactive, carcinogenic, toxic, or special biological materials fails.
- There is a reason to believe the equipment is no longer operating in accordance with performance or design specifications.

- ***Move:** the following “Effectiveness of Equipment” information from Guidance to Requirements and change the “should” to “shall”:


- 
- Members of the Workforce shall consult the appropriate Division ES&H Team member to obtain the following services:
 - Evaluation of the effectiveness of the LEV equipment in controlling potential hazards
 - Guidance on whether a process change affects the capability of the LEV equipment to control potential hazards. Process changes include:
 - Additional process equipment in the LEV equipment
 - Reconfiguration of process equipment with respect to LEV equipment, including the distance between the process and LEV
 - Change of process materials
 - Modification of the LEV system
 - Modification of the lab or building ventilation system
 - Relocation of the LEV equipment
 - Introduction of processes that impart heat or velocity to potential hazards
- 
-

June 22, 2006

Chapter 21, "Technical Work Documents (TWDs)"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- 
- ***Delete:** All references to RWPs, since they have been disengaged from TWDs per NTS Corrective Action, NTS-2005-0013 #169 and #170.
 - Under topic heading, "Developing TWDs and Determining Need":
 - ***Add:** A requirement for managers to develop TWDs when recommended by their Division ES&H Team to document activity-level hazards and associated control measures for a specific work activity.

- **Add:** Paragraph under guidance that document specifics for SNL/CA.
- Under topic heading, “Incorporating ISMS into TWDs”:
 - ***Change:** Verbiage in step 1 to include:
 - Ensure that TWD procedures will **not** exceed the bounds of the governing primary hazard screening ([PHS](#)) (e.g., location, scope of work, [hazards](#)).
 - Identify Authorized Users that will be authorized to implement procedures. Describe the duties of Authorized Users that are unique to the activity, and include interfaces with other organizations.
 - Specify where the work will be conducted and to which piece(s) of equipment the procedure applies.
 - ***Change:** Verbiage in step 3 to include: The TWD shall incorporate controls steps at appropriate places (such as hold points where ES&H support personnel must provide monitoring or surveillance). Verification checks by an observer should be considered if a mistake could result in injury or a release of hazardous material. Include emergency actions where necessary.
 - ***Change:** Verbiage in step 4 to include: The manager shall determine when a revision is necessary, the frequency, and the extent of review and re-approval required to adequately control hazards. Lower-Tier Documents that are attached to or referenced by a TWD shall be included in the review/revision of the parent document.
 - ***Change:** Verbiage in last paragraph of requirements to include: Consult the appropriate [Division ES&H](#) Team for assistance with identifying appropriate controls if necessary.
- Under topic heading, “Additional Elements of a TWD”:
 - ***Add:** New requirement for managers to address conflict or contradiction between TWDs.
 - **Add:** Paragraph under guidance to state specifics for procedures owned by multiple organizations.
 - **Add:** Paragraph under guidance to state specifics for the procedures approval page and reviewer page.

- Under topic heading, “Skill-of-the-Worker”:
 - ***Add:** A requirement for managers to consult with their [Division ES&H Team](#) to determine if a TWD is an appropriate control for hazardous work activities that do not require use of a TWD

- Under topic heading, “Review and Approval of TWDs”:
 - ***Add:** Requirements for Members of the Workforce to contact their [Division ES&H Team](#) to obtain:
 - Assistance with the identification and evaluation of hazards, [control measures](#), [personal protective equipment \(PPE\)](#), and monitoring requirements.
 - A technical review of TWDs to control hazardous work activities.
 - Assistance with procedure [walk downs](#) when TWDs are used as a control for hazardous work activities.
 - ***Add:** Section note that specifies; industrial hygiene (IH) approval is required for TWDs, unless an established approval process exists for a specific hazard addressed in the ES&H Manual (e.g., Section 6I, “Confined Space”)



Glossary:

Add:

- Lower tier document

June 21, 2006

[Section 6Y](#), "Thermal Stress"

Note:(*) asterisk denotes substantive change.

This section was revised to:

Under topic, “Control of Heat Stress:”

- ***Change:** Guidance for managers to contact their [Division ES&H Team](#) for assistance was changed to a requirement and moved to the "Requirements" topic as follows, "Managers shall contact the IH on their [Division ES&H Team](#) for assistance with the following:
 - Determining exposures to [heat stressors](#) and the applicability of ACGIH [TLVs](#).
 - Determining appropriate control measures to reduce exposure of Members of the Workforce to heat stressors.
 - Determining a work/rest regimen as an administrative control.
 - Identifying, evaluating, and controlling [thermal hazards](#) associated with [heat stress](#).
 - Training Members of the Workforce to recognize signs and symptoms of heat-related illnesses.
 - Ensuring that Members of the Workforce have access to water prior to and during tasks that require exposure to both hot and cold environments.

Note: The reduction of dehydration has been found to be instrumental in protecting individuals from illness and injury related to heat stress and [cold stress](#)."

- **Clarify:** The following requirement, "If clothing does not allow air and water vapor movement, or if the criteria found in Attachment 6Y-1, "[Heat Stress Screening Criteria](#)," are exceeded, contact the [Division ES&H Team](#) so that [heat-strain](#) monitoring can be performed" was changed to clarify, "If clothing does not allow air and water vapor movement, or if the criteria found in Attachment 6Y-1, "[Heat Stress Screening Criteria](#)," are exceeded, contact the IH on their [Division ES&H Team](#) so that [heat-strain](#) monitoring can be performed."
- Under topic, "Control of Cold Stress and Cold Injury:"
 - ***Change:** The guidance for managers to contact their [Division ES&H Team](#) for assistance was changed to a requirement as follows, "Managers shall contact the IH on their [Division ES&H Team](#) for assistance with the following:
 - Determining exposures to [cold stressors](#) and the applicability of ACGIH [TLVs](#).
 - Determining appropriate control measures to reduce exposure of Members of the Workforce to cold stressors that can result in [hypothermia](#), [frostbite](#), [trench foot](#), etc.

- Determining a work/warming regimen as an administrative control.
- Recognizing signs of hypothermia; e.g. shivering, dizziness, drowsiness, irritability, and diminished levels of consciousness and dexterity.
- Identifying, evaluating, and controlling [thermal hazards](#) associated with [cold stress](#).
- Training Members of the Workforce to recognize signs and symptoms of cold-related injuries and illnesses.”

June 15, 2006



Section 4B, "Electrical Safety Practices"

Note: (*) asterisk denotes substantive change.

- Add “Review Date: June 13, 2006” to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- Under topic, “Electrical Shock Approach and Arc Flash Protection Boundaries”:
 - ***Add:** After sentence “The manager responsible for authorizing Members of the Workforce to perform appropriate energized electrical work on circuits operating at 50 to 750 volts shall,” add the following “Note: A facility electrician may request an electrical engineer to determine/establish the shock approach boundaries for a particular electrical work, in which case the shock approach boundaries used may differ from the shock approach boundaries listed below. Facility electricians include electricians working in either the Facilities Management & Operations Center (NM) (10800) or the Site Operations Center (CA) (8500).”
 - ***Change:** In the bullet subordinate to the bullet titled “Establish shock approach boundaries as described below and shown in figure 1,” change the second sentence from “This limited approach boundary is intended to control access to exposed energized electrical circuit parts by unqualified workers” **to** “This boundary is intended to serve as the limit at which a person is considered to be working near energized electrical parts and signifies the requirement for a technical work document. This boundary is also intended to control access to exposed energized electrical circuit parts by unqualified workers.”





- ***Delete:** In the bullet which starts out “Procedurally establish a restricted-approach shock boundary at 1 foot from the exposed ...,” delete the fourth sentence which states “This boundary is intended to serve as the limit at which a person is considered to be working near energized electrical parts.”
- ***Change:** In the bullet which starts out “Procedurally establish a restricted-approach shock boundary at 1 foot from the exposed ...,” change the fifth sentence from “This boundary is also intended to prohibit use of conductive objects ...” **to** “This boundary is intended to prohibit use of conductive objects”

- Under topic, “Electrical Personal Protective Equipment (Electrical PPE)”:

- ***Add:** After the last note, add the following: “Note: A facility electrician may request an electrical engineer to determine the required/appropriate electrical PPE selection for a particular electrical work, in which case the electrical PPE selection may differ from the electrical PPE specified above. Facility electricians include electricians working in either the Facilities Management & Operations Center (NM) (10800) or the Site Operations Center (CA) (8500).”



- Under topic, “TECHNICAL WORK DOCUMENTS (TWDs) – Energized Work Permit Form (EWP), and Operating Procedures (OPs)”:

- ***Change:** In the first bullet, change the first sentence from “Justify, plan, and authorize all appropriate energized electrical work above 50 volts using the energized work permit form [SF 2005-EWP (10-2005)]” **to** “Authorize the justification and work plan for all appropriate energized electrical work above 50 volts using the energized work permit form [SF 2005-EWP (10-2005)].”
- ***Delete:** In the first bullet, delete the second sentence which states: “Authorization for routine troubleshooting, and diagnostic and measurement types of appropriate energized electrical work tasks can be accomplished using other TWDs (i.e., operating procedures).”



- ***Delete:** In the first bullet, delete the third sentence which states: “Performance of the zero energy verification Lockout/Tagout (LOTO) step is an example of a measurement type of appropriate energized electrical work that would be authorized and explained in an equipment specific LOTO operating procedure (OP).”
- ***Add:** In the first bullet, after the first sentence, add the following sentence: “The energized work permit is applied for all electrical work tasks associated with circuit repair or reconfiguration while that circuit is in the energized state.”

- ***Add:** Add the following second bullet and associated subordinate bullets:
 - Authorize routine troubleshooting/diagnostic and other measurement types of appropriate energized electrical work tasks using other TWDs (i.e., operating procedures). Senior Manager authorization of such TWDs shall be evident by Senior Manager signature on the TWD. Such TWDs shall be department specific and identify:
 - The types of equipment upon which department staff may perform such electrical work tasks.
 - The electrical hazards (i.e., arc flash and shock) associated performing such electrical work tasks on identified equipment types.
 - Operating voltages and currents, and energies.
 - General electrical safety work practices and controls that will be used during performance of such work tasks so as to avoid identified electrical hazards.
 - Work practices and controls include:
 - Work methods (e.g., measurement techniques, guarding various circuit parts, body positioning, shock approach boundary establishment so as to prevent inadvertent contact with energized circuit parts).
 - Use of insulated tools.
 - Use of appropriate personal protective equipment for arc flash and shock protection rated for the highest arc flash energy and voltage present (e.g., gloves, hard hats, safety shoes, eye and face protection, insulated live-line tools, cotton clothing, and arc protection).

- ***Delete:** Delete the former third bullet which states: “Ensure other TWDs document the identification and evaluation of shock and arc flash hazards, and the means for Members of the Workforce to avoid exposure to those electrical hazards (i.e., safe work methods or practices, use of insulated tools, and use of electrical arc and shock PPE).”
- **Change:** Change the former fourth bullet from “Ensure other TWDs are written ...” to “Ensure TWDs are written....”

- ***Change:** Change the former fifth bullet from “Ensure other TWDs address the following commensurate with the risks to electrical workers face when performing electrical work tasks...” to “Ensure TWDs address the following commensurate with the risks to electrical workers relative to their assigned electrical work tasks....”

- ***Delete:** Delete the following bullets which are subordinate to the former fifth bullet:

- Testing of equipment to ensure safe conditions.
- Grounding of conductors and all possible conducting parts.
- Provisions for qualified and properly equipped standby personnel.
- Worker knowledge of electrical hazards and associated safe work practices.
- Provisions of electrical PPE rated for the highest voltage present (e.g., gloves, hard hats, safety shoes, eye and face protection, insulated live line tools, cotton clothing, and arc protection).

- ***Add:** Under the former fifth bullet, add the following subordinate bullets:

- Grounding of conductors and all possible conducting parts.
- Provisions for qualified and properly equipped standby personnel (i.e., safety watch or 2 nd person).

- Under topic, “Power Strips, Extension Cords, and Uninterruptible Power Supplies (UPS)”:

- ***Add:** Under “Requirements,” after the first bullet, add the following bullet: “Use power strips for low-powered loads, such as computers, peripherals, fans, radios, pencil sharpeners, etc.
- ***Delete:** Under “Requirements,” delete the bullet “Use power strips to provide power and surge protection for sensitive electronic equipment, such as computer equipment.”

Section 19B, "Radioactive Waste Management "


Note: (*) asterisk denotes substantive change.

This section has been revised to:

- **Change:** CA Counterpart from Warren Tenbrook to Mark Brynildson in this section and its attachments.
- ***Move:** Topic, “Waste Minimization” under “Training,” and “Waste Characterization – Process Knowledge” under “Planning and Preparation” in both the TOC and the section.
- **Clarify:** Topic header from “Treatment of Radioactive Waste” to “Processing of Material or Treatment of Radioactive Waste.”
- ***Delete:** Form, SF S2001, CAL, Radioactive Waste Accumulation Area Inspection Log.
- ***Delete:** “/NM” where ever it occurs in the form titles.
- ***Add:** Form, SF 2042-NCI, SNL NTS Non-conforming Items.
- Under the topic, “Applicability,” under the subtopic, “Exemptions”:
 - ***Delete:** “Radioactive waste that is managed by SNL/CA.”
 - **“Note:** For information regarding SNL/CA, see [CPR400.1.1.37/GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*”.
 - **“Note:** If SNL/CA requests that SNL/NM accept SNL/CA radioactive waste for storage and subsequent treatment and disposal, then the [waste acceptance criteria](#) discussed in this section apply to SNL/CA, along with [CPR400.1.1.37/GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*”.
- Under the topic, “Training”:
 - ***Change:** Under “Work Activity or Role,” separate roles for each NM and CA and corresponding “required” and “recommended” training.
 - ***Add:** To the ES&H coordinator role, “and environmental protection representative.”
 - ***Add:** *ENV252 and its corresponding note, “ENV252 is a refresher of ENV189 that is required every 2 years.”
 - **Clarify:** Under the subtopics, “Requirements” and “Guidance,” use “train” rather than “brief.”
- Under the topic, “Waste Minimization”:

- ***Change:** In the first note, waste “management” to waste “minimization.”
- ***Add:** To the end of the last sentence under the third bullet, “and waste management.”
- Under the topic, “Planning and Preparation”:
 - **Change:** Under Requirements, in the first sentence, “how to appropriately” to “and.”
 - ***Add:** To the end of sentence referred to above, “in accordance with PG470228, *SNL Radioactive Waste Management Basis*.”
 - **Clarify:** In the first bullet, spell out TWD.
 - ***Change:** “includes information on radioactive materials used that could potentially generate radioactive waste” to “addresses how radioactive waste will be managed.”
 - **Clarify:** Reorganize the first set of sub-bullets to place the statement about waste characterization at the top.
 - ***Change:** In the first note, “should” to “shall” and reword for parallelism to read, “Reference Section 19B, “Radioactive Waste Management,” in the TWD and state that the requirements in Section 19B of the ES&H Manual shall be followed. ” and make it a level one, bulleted item.
 - **Clarify:** In the next bullet, Meet any other applicable “packaging and labeling” requirements...
 - ***Change:** The second note, “Consult the appropriate Division ES&H Team environmental protection representative and the...” to “waste certification official.”
 - **Clarify:** The second note, “...including local DOE oversight office requirements at SNL remote sites.”
- Under the subtopic, “Guidance”:
 - **Change:** “Consult the appropriate [Division ES&H Team](#) environmental protection representative and the [waste characterization team leader](#) before waste is generated, to resolve questions regarding [radioactive waste](#) generation, characterization, accumulation, packaging, segregation, control, and disposal





pathway.”

to

- “Consult the appropriate [Division ES&H Team](#) environmental protection representative before waste is generated, to resolve questions regarding [radioactive waste](#) planning, accumulation, packaging, segregation, control, and disposal pathway.”
- **Delete:** The last bullet, “Provide an annual volume and weight forecast in the third quarter of the fiscal year to the [Pollution Prevention Program](#) and the [Waste certification official \(WCO\)](#) contacts.”



● Under the topic, “Waste Characterization – Process Knowledge”:

- ***Add:** Under the first note, “ Note : When process knowledge relies on living memory, the individual’s knowledge shall be documented and signed by both the interviewer and the interviewee. For telephone interviews, a statement outlining relevant information shall be signed by the interviewer (and interviewee if possible).”
- **Move:** The third note about the characterization website under the first set of sub-bullets.

● Under the subtopic, “Guidance”:

- **Add:** Additional detailed guidance for Primary waste generators in obtaining sufficient process knowledge, a description of process knowledge as a characterization technique, and list of sources.



● Under the topic, “Wastes with No Disposal Path”:

- ***Change:** Contact from “Division ES&H Team environmental protection representative” to “NDP waste contact” in the note and the second bullet.

● Under the topic, “Radioactive Waste Accumulation Area”:

- ***Add:** In the third bullet, RMMA contact.
- **Add:** To the last bullet, “Division ES&H Team.”
- **Delete:** In Guidance, reference to example form, SF 2001 CAL.



- Under the topic, “Waste Containers, Labeling, and Packaging”:

- ***Change:** “Primary waste generators” to “Members of the Workforce.”
- ***Add:** Note regarding the definition of a waste parcel.
- ***Change:** Metal box sizes from “2x4x7” and “4x4x7,” to “7x4x2” and “7x4x4” ft. metal boxes.
- ***Change:** Liner to an SNL/NM-certified liner.
- ***Clarify:** By reorganizing labeling information and references in all the tables.
- **Change:** “Clear” to “translucent.”
- ***Change:** In the “Liquid Radioactive Waste” table in the last note, fill liquid waste containers from “80%” full to “50%.”



- **Add:** Under “Guidance,” an additional contact, waste certification official.

- **Change:** Box size to “7x4x4”
- **Delete:** Note: SNL/CA implements container purchase, certification, and inspection according to the SNL/CA Nevada Test Site Waste Acceptance Criteria (NTSWAC) Program. Additional requirements, as described in this section, will be implemented if SNL/CA waste containers are received at SNL/NM.

- Under the topic, “Segregation and Control of Radioactive Waste”:

- ***Change:** Contact for assistance to “waste certification official.”
- ***Add:** Note referring SNL/NM and CA to resources for additional information of segregation of Potential RCRA-regulated waste.
- ***Delete:** Reference to “ Section 4 subparts (j) and (k).”
- ***Add:** “ Segregate accountable material from radioactive waste.”
- ***Change:** Reorganize the text throughout under this subtopic.
- ***Add:** “Explosives.”
- ***Add:** Reference to “40 CFR 761.50(b)(7).”



- ***Delete:** Reference to “DOE Order 435.1.”
- ***Add:** “Animal carcasses that are preserved in formaldehyde.”
- ***Change:** Contact for assistance from “Division ES&H Team” to “waste certification official.”
- ***Clarify:** Following is a list of “special” items.
 - ***Add:** “Free liquids.”
 - ***Add:** “ **Note:** For SNL/CA, beryllium-contaminated low-level waste is regulated as mixed waste. For additional requirements regarding management and labeling, see Section 19C and CPR400.1.1/GN470075, *Guidelines for Hazardous Waste Generators at SNL/CA.*”
 - ***Add:** “**Note:** For SNL/CA, asbestiform low-level waste is regulated as mixed waste. For additional requirements regarding management and labeling, see Section 19C and CPR400.1.1/GN470075, *Guidelines for Hazardous Waste Generators at SNL/CA.*”
 - ***Add:** Polychlorinated biphenyls ([PCBs](#)) that meet the standards under 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, Subpart D, “Storage and Disposal” [[40 CFR 761.50\(b\)\(7\)](#)] for disposal in landfills.

- Under the topic, “Waste Characterization – Sampling and Analysis”:

- ***Change:** Contact for assistance to “waste characterization project leader.”
- ***Change:** Move sampling and analysis plan requirements.
- **Change:** Throughout the section, “waste characterization team leader” to “waste characterization project leader.”

- Under the topic, “Processing of Material or Treatment of Radioactive Waste”:

- ***Change:** In Note, “80% full” to “50% full.”

- Under the subtopic, “Guidance”:

- **Delete:** “ Contact the appropriate [Division ES&H Team](#) environmental protection

representative on a waste-stream-specific basis if approval is needed for treatment of radioactive material or waste at the generator location.”

- Under the topic, “Disposal Request for Pickup of Radioactive Waste”:
 - ***Change:** “Radioactive Waste/Nuclear Material Disposition” to “Regulated Waste/Nuclear Material Disposition.”
 - ***Add:** “ Sign the Generator Waste Accumulation Disposal Log when completed.”
 - ***Change:** In “The Primary waste generator “shall” sign the DR,” “should” to “shall.”
 - ***Delete:** Reference to SF2042 PKE.
 - ***Change:** Requirements and Guidance apply to all SNL not only SNL/NM.
 - ***Clarify:** Requirements and roles when the waste is or is not covered by SF 2042-PKE.
 - ***Delete:** “Identify the primary waste generator in Section 1, “Waste Generator/Custodian Information.”
 - ***Clarify:** Document and format when attaching to the (Disposal Request) DR.
 - ***Add:** “Note: Once the DR is approved by the RWNMDD, the RWNMDD pick-up crew will call to schedule pick-up of the radioactive waste.”
- Under the subtopic, “Guidance”:
 - **Delete:** The role, “waste custodians”
- Under the topic, “Certification of Radioactive Waste”:
 - ***Add:** “**Note:** The waste certification official periodically observes waste packaging activities that are conducted by the primary waste generator.”
 - **Clarify:** “nonconformance” to “finding.”
- Under the topic, “Nonconformances”:
 - ***Change:** Requirements and Guidance apply to all SNL not only SNL/NM.
- Under the topic, “References”:

- ***Add:** [40 CFR, 700-789](#), *Toxic Substances Control Act Regulations*
- In Attachment 19B-1:
 - ***Change:** Under the topic, “Consumer Products,” in the note under “Requirements,” “will” to “shall.”
- In Attachment 19B-3:
 - **Delete:** Sample of the small “Caution Radioactive Material” warning label and its caption.
 - **Add:** Caption under the “Danger Contains Asbestos Fibers” label.
- In Attachment 19B-6:
 - **Change:** “Radioactive” Waste/Nuclear Material Disposition Department (RWNMDD) to “Regulated” Waste/Nuclear Material Disposition Department (RWNMDD).
- In the DAS List:
 - Under Q:
 - **Change:** “Quality Assurance Project Leader” to “Quality Assurance Program Project Leader.”
 - Under W:
 - **Change:** “ Waste characterization team leader ” to “Waste characterization project leader.”
 - Under Waste management:
 - **Delete:** “ Hazardous and Solid Waste Department (NM), Tom Laiche (NM) [As of 10/26/05]”
 - **Move:** From NM column to CA column, “Environmental Operations Department (CA), Gary Shamber (CA) [As of 10/26/05]”
 - **Change:** “Radioactive and Mixed Waste Department (NM)” to “Regulated Waste/Nuclear Material Disposition (NM).”



Section 19C, "Mixed Waste Management"

Note: Over 75% of this section is either new or has changed and should be read in its entirety.

Note:(*) asterisk denotes substantive change.

- In the "ES&H Glossary":

- **Clarify:** The following definitions:

- Less-than-90-day accumulation area
- Mixed waste

- ***Delete:** The following definitions:

- Mixed waste (California)
- Mixed waste generator

- **Clarify:** The following definitions:

- Primary waste generator
- Naturally Occurring Radioactive Material (NORM)
- Radioactive material management area (RMMA)
- Radioactive waste
- Satellite accumulation point (SAP)
- Waste certification official (WCO)
- Waste custodian
- Waste package
- Waste parcel





Administrative Changes Only June 14, 2006

Section 4M, " Signs (Including SWHAS) and Tags"

This section was revised to:

- Under topic heading, "References":
 - **Change:** 29 CFR 1910.37, "Means of Egress, General" to 29 CFR 1910.34, "Means of Egress, General."
 - **Change:** Contact SME in footer **from** Miriam Minton **to** Willie Johns.



- Under Attachment 4M-1 – "Sandia Workplace Hazards Awareness System (SWHAS)":
 - **Add:** note 1, "The NFPA Hazardous Materials Classification symbol link above and throughout this document will direct users to the Sandia Tech Library. To view the NFPA 704 standard, users must click the "Specs and Standards" link, and on the following page type NFPA 704 in the "Doc. No:" box and click "Search.""

Administrative Changes Only June 8, 2006

Section 22A, "ES&H Line Self-Assessment (SA) Activities"

This section was revised to:

- **Replace:** All references to applicable or approved database with the Line ES&H Self-Assessment Application (LESA).
- Under topic, "Roles and Responsibilities":
 - **Delete:** The responsibility for managers to download SA information results from the approved database into the scorecard after each SA. The scorecard process does not exist. It was an initial piece of the updated SA process but was never implemented.

Administrative Changes Only

June 7, 2006



Section 6C, "Respiratory Protection"

This section was revised to:

- Under topic heading, "Respiratory Protection Process":
 - **Clarify:** The requirement for managers to contact the appropriate [Division ES&H Team](#) to conduct a worksite evaluation to determine the need for respiratory protection if activities generate airborne contaminants by adding: (to evaluate chemical and biological hazards, contact the Industrial Hygiene representative on the Division ES&H Team and to evaluate radiological hazards, contact the Radiation Protection representative).
- Under topic heading, "Medical Review and Approval":
 - **Delete:** The note that states; "medical authorization for confined space entry activities does **not** constitute approval for respiratory protection." (When DOE issued Order 440.1A, the ANSI standard on confined spaces as a "mandatory reference" was removed and as a consequence, the requirement for medical authorization of confined space entrants is no longer in effect.)
 - **Clarify:** The requirement for Members of the Workforce to complete and submit SF 2001-MCR, Sandia National Laboratories/New Mexico Respiratory Protection Selection and Medical Evaluation ([Word file/Acrobat file](#)) or SF 2001-MCS, Sandia National Laboratories/California Respiratory Protection Selection and Medical Evaluation ([Word file/Acrobat file](#)) to obtain respiratory protection by adding: (if chemical or biological materials are involved in the activity, contact the Industrial Hygiene representative on the Division ES&H Team for assistance in completing the form. If radiological materials are involved in the activity, contact the Radiation Protection representative on the Division ES&H Team for assistance in completing the form).
- Under topic heading, "Respirator Use":
 - **Clarify:** The requirement for Members of the Workforce to coordinate with the appropriate [Division ES&H Team](#) (Industrial Hygiene for chemical/biological hazards or Radiation Protection representative for radiological hazards) for a worksite assessment and respirator selection prior to issuance and use of a respirator or filtering facepiece (dust mask).
 - **Clarify:** the requirement for Members of the Workforce to consult the appropriate



[Division ES&H Team](#) (Industrial Hygiene for chemical/biological hazards or Radiation Protection representative for radiological hazards) if changes occur in operational conditions that may impact potential exposure or respirator selection.



May 18, 2006

[CPR 400.1.1, ES&H Manual](#) has been revised to:

Note:(*) asterisk denotes substantive change.

- ***Cancel:** Section 10K, "Underground Storage Tanks."

The information formerly contained in Section 10K can be found in the following section of CPR400.1.1/MN471001, *ES&H Manual*:

- [Section 10F](#), "Oil and Fuel Storage"



Administrative Changes Only
May 18, 2006

[Section 4L](#), "Personal Protective Equipment "

This section was revised to:

- **Change:** The subject matter expert (SME) from Chad Hjorth to Jared Mowrer.
- **Change:** The NM SME listed in the Direct Access Services (DAS) list as the "Personal protective equipment (PPE)" contact from Chad Hjorth to Jared Mowrer.
- Under topic, "Protective Footwear," under Guidance:



- **Change:** The first bullet from "To purchase up to two pairs of safety shoes, if needed and with their manager's approval, at SNL's expense and may spend up to \$130 per pair per year. For special requirement shoes, managers may approve expenditures for more than \$130" **to** "To purchase up to two pairs of safety shoes, if needed and with their manager's approval, at SNL's expense and may spend up to \$140 per pair per year. For special requirement shoes, managers may approve expenditures for more than \$140. "

Administrative Changes Only May 17, 2006

Section 13C, "Authorization Basis Process"



This section was revised to:

- **Change:** The SME from Dann Ward to Stephen A. Coffing.

Section 13D, "Readiness Review Process - Planning, Review, and Approval"

This section was revised to:

- **Change:** The SME from Dann Ward to Barry Goldstein.



Administrative Changes Only May 16, 2006

Section 4H, "Excavations, Trenches, and Floor or Wall Penetrations "

This section was revised to:

- **Change:** The subject matter expert (SME) was changed from C. Brian Drennan to Andrew Zeitler.
- **Change:** In the Direct Access Services (DAS) list under the heading "Excavations, trenches, and floor and wall penetrations," the NM SME was changed from C. Brian Drennan to Andrew Zeitler in the following subordinate contact listings:
 - Evaluating potential hazards related to floor and wall penetrations
 - Safety issues



Administrative Changes Only May 11, 2006

Section 4K, "Traffic Safety"

This section was revised to:

- Under topic heading "Parking":
 - **Add:** to the note at the end of the section a statement that reads; additional information can also be found in the Sandia National Laboratories/New Mexico Parking Regulations document.



May 8, 2006

***ES&H Manual* Issues FV, and FW were posted this date**

Section 6B, "Asbestos"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- Under topic, "Applicability":
 - ***Add.** For research activities handling asbestos, see CPR400.1.1/MN471001, *ES&H Manual*, Section 6D, "Hazard Communication Standard" and CPR400.1.1/MN471001, *ES&H Manual*, Section 6E, "Laboratory Standard – Chemical Hygiene Plan."
- Under topic, "Asbestos Control":
 - ***Change.** Guidance for contacting ES&H SME was previously stated as follows, "Members of the Workforce should see the asbestos contact." Based upon OA (DOE) findings, this guidance was changed to the following requirement, "Members of the Workforce shall see the asbestos contact."
 - ***Change.** The [asbestos](#) contact was changed on the Direct Access Services List from [Charlotte Hoffmeister \(NM\)](#) to [Chris French \(NM\)](#).



Section 19F, "Other Waste"

Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Add:** CA Counterparts, Janet Harris and Laurie Farren
- ***Add:** The topic, "Beryllium-Contaminated Waste" to the TOC.
- ***Add:** Attachment, 19F-1, "Certification of Noninfectious Material."
- ***Add:** The topic, "Beryllium-Contaminated Waste" with the corresponding requirements to the section.

Note: The requirements for "Beryllium-Contaminated Waste" have been moved from Section 19A, "Hazardous Waste," with no additions or deletions, prior to review of 19F.

- Under the topic "Applicability":
 - ***Add:** "Requirements and guidance for Members of the Workforce at SNL/CA are contained in CPR400.1.1.37/GN470075, "Guidelines for Waste Generators."
- Under the topic "Beryllium-Contaminated Waste":
 - ***Clarify:** Beryllium is not regulated as a hazardous waste.
 - ***Clarify:** " Members of the Workforce who are owners or generators and any waste..."
 - ***Clarify:** The first two bullets under the Danger warning:
 - Follow the requirements contained in Section 19A, "Hazardous Waste Management" if the beryllium waste also contains hazardous waste.
 - Contact the appropriate Division ES&H Team environmental protection representative for specifics regarding hazardous waste.
 - **Change:** "labeled" to "marked," in the Note.
- Under the topic "Infectious Waste":



- ***Clarify:** "Members of the workforce who generate waste shall determine if the waste meets the definition of infectious waste."
- **Add:** Guidance: "Members of the Workforce should consult the appropriate Division ES&H Team environmental protection representative for assistance in making this determination."
- ***Add:** The following subtopics with the corresponding requirements and guidance for each:
 - "Infectious Waste Containment, Marking, and Storage"
 - "Disposal of Infectious Waste"
 - "Rendering Infectious Waste Non-Infectious"



- Under the topic "Industrial Solid Waste":
 - ***Change:** Under the third bullet, in the first sub-bullet, "Approved by Hazardous and Solid Waste Department (3124)" to "Approved by the SME."
- Under the topic "Management and Disposal":
 - ***Delete:** In the second bullet, "and the waste container is accepted and stored at the approved special waste storage area."
- Under the topic "References":
 - ***Delete:** 40 CFR 246.10




Administrative Changes Only May 4, 2006

Section 6G, "Lasers and Intense Light"

This section was revised to:

- Under the topic, "Other Qualifications":
 - **Change:** Under "Requirements," change the first sentence from "Members of the Workforce who have been assigned to work with or around a Class 3b or 4 laser



system shall obtain a baseline eye examination” to “Members of the Workforce who have been assigned to work with or around a Class 3b or 4 laser system shall obtain an eye examination.”

- **Add:** Under “Requirements,” after the first sentence, add the following sentence: “MOWs who have been assigned to work directly with Class 3b or 4 lasers shall obtain a baseline laser eye examination; MOWs who have the potential for incidental exposure (e.g., custodians, observers, and supervisory personnel not working directly with lasers) to class 3b or 4 lasers shall have an eye exam for visual acuity.”

April 27, 2006

Section 4V, "ES&H for Contracted Construction and Construction-Like Activities"



Note:(*) asterisk denotes substantive change.

This section was revised to:

- **Change.** The subject matter expert (SME) was updated to from Bryan Drennan to Greg Kirsch throughout the parent document and all attachments.
- **Change.** Typos corrected.
- Under Applicability,
 - ***Add.** Revised to indicate this section, “provides guidance to managers who direct construction-like activities involving MOW.”
 - ***Add.** The term, “on Sandia controlled sites” was added with a link to the Glossary.
 - **Delete.** The notes which provided additional guidance for Sandia-directed contractors were removed.
- Under Managing Contractor-Directed Contracts,
 - ***Add.** Explanation of delegated responsibilities.
 - ***Add.** The acronym, “FMOC” was added throughout the document.
 - ***Add.** SNL Policy for Construction and Construction-like Activities, January 22,

2006.

- ***Add.** Requirements were revised to specify, managers shall use SNL Procurement to place contractor-directed contracts for performing construction and construction-like activities.
- **Change.** FBU was replaced by FMOC.
- **Delete.** Instructions on appointing a SDR and identifying ES&H training requirements and responsibilities for contracted work.
- **Add.** Managers shall ensure the appropriate technical competence complies with requirements of this section.
- ***Add.** Managers shall ensure requested SOWs require the contractor to address the requirements of this section.
- **Change.** Reference to “personnel” was changed to specify Members of the Workforce (MOW).
- ***Add.** Instructions for communicating schedules and anticipated hazards related to construction and construction-like activities to affected MOW.
- ***Add.** Requirements ensuring activities have been reviewed for NEPA in accordance with Section 10B, “National Environmental Policy Act (NEPA), Cultural Resources and Historic Properties” and with Section 10C, “Migratory Birds, Protected Species, and Other Biota.”
- ***Add.** Requirements for reviewing specified documentation submittals.
- **Delete.** Or buyer.
- ***Change.** Notify the SCR, as soon as it is safe to do so, when work has been suspended due to imminent danger, and subsequently when hazards have been appropriately controlled or abated.
- ***Delete.** The title of subheading, “Guidance” was removed.
- ***Delete.** The words, “Managers should” were removed.
- ***Add.** A requirement that the SDR shall ensure work in radiological or nuclear facilities have the Q-sig contract language and a requirement that the work have an ALARA design study if the work will affect radiological safety.

- Under Integrated Safety Management System (ISMS) Plan,
 - ***Change.** Requirements specify construction-like work activities.
- Under Work Plan,
 - ***Change.** Requirements were to clarify examples for small-scale construction-like activities involving routine work tasks and customary hazard controls.
 - *** Add.** List of minimum requirements for contractor-submitted work plan for complex and non routine hazardous work.
 - ***Add.** Additional SDR guidance.
 - *** Change.** Reference to “SNL” was replaced by “Sandia.”
- Under Permits,
 - ***Add.** List of additional required permits.
- Under Routine Inspections,
 - ***Add.** Maintain documentation of inspections in project file until project closeout, at a minimum.
 - **Change.** Reference for guidance on transferring records to the appropriate records retention facility was updated to [CPR 400.2.20](#), *Retention and Disposition of Recorded Information*.
- Under Emergencies, Accidents, and Injuries,
 - ***Change.** Requirements for Managers and SDR which ensure contractors performing under contractor-directed contracts.
 - ***Add.** Follow SNL [Internal Management-Notification Process for Employee Injuries](#).
 - Under Leased Equipment for Construction-Like Work,
 - **Add.** Requirements for Managers to insure consistency with Sandia requirements for leasing and procurement.
 - **Add.** MOWs who are operators shall be trained on the equipment they will use on the project or activity prior to use.

- **Add.** “Contractors performing under contractor-directed contracts shall follow their own requirements, as long as such requirements are consistent with Sandia requirement for the work being performed.”

- Under Related Hazards and Activities,

- **Change.** References were clarified to indicate proper CPR identification numbers and updated titles.
- ***Add.** Section 6G, “Lasers and Intense Light.”
- ***Add.** Section 6H, “Noise Exposure and Hearing Conservation.”
- ***Add.** Section 6J, “Nonionizing Radiation.”
- ***Add.** Section 6C, “Respiratory Radiation.”
- ***Add.** Chapter 11, ES7H Training.”
- ***Add.** Chapter 21, “Technical Work Documents (TWDs).

- Under References,

- ***Add.** 29 CFR 1926, *Safety and Health Regulations for Construction.*
- *** Add.** DOE Acquisition Regulation (DEAR) 970-5204-2, *Integration of Environmental, Safety and Health Into Work Planning and Execution.*
- *** Add.** DOE-STE-1149-2002, *Safety & Health Program for DOE Construction Projects.*
- *** Change.** Reference was revised to specify CPR identification number.
- ***Delete.** SNL, PG470218, *Worker Protection Program (WPP).*
- ***Change.** ANSI/EE C2-2002, *National Electrical Safety Code* reference was clarified.
- *** Add.** NFPA 70E, *Standard for Electrical Safety Requirements for Employee Workplaces.*

- In Attachment 4V-1,

- **Change.** Guidance on Hazard Awareness was revised to “Communicate work hazards and controls to employees and sub-contractors prior to initiating new work and at regular work site meetings.”
- In Attachment 4V-2,
 - **Add.** “Lack of exposure assessment,” added to elements addressing, hearing and respiratory protection.
 - **Add.** “Members of the Workforce may be present during daily inspections but are not required to be present,” was added to section addressing Safety Inspections.
 - **Change.** “Discuss” was replaced with, “Communicate” within the section addressing Performance Reviews.



Chapter 16, "Health, Benefits, and Employee Services"

Note:(*) asterisk denotes substantive change.

This chapter was self-assessed on March 20, 2006.

This chapter was revised to:

- **Change:** Chapter title, from “Benefits and Health Services” to “Health, Benefits, and Employee Services” throughout the section.
- **Change:** “Employee Assistance Program (EAP)” to “Behavioral Health Program” throughout the section.
- **Change:** “ ¡SALUD! ” to “Preventive Health” throughout the section.
- ***Add:** New form, “ SF 2001-IMN, Interim Report to Laboratory Director: Internal Management-Notification Process for Employee Injuries.”
- ***Delete:** Form, SF 4040-MRE, Formal Management Referral to Employee Assistance Program (EAP).
- Under the topic, “Training”:
 - ***Add:** Security Police Officers, Members of the Workforce who work in high voltage/ high risk jobs, or who are designated to be in charge of an AED.





- **Change:** “Scuba diving” to “deep water diving.”

- Under the topic, “Medical Emergencies”:

- ***Change:** “Managers” to “Members of the Workforce.”
- **Change:** “24 hour emergency Health Services phone number” to “24 hour emergency phone number.”
- **Add:** “or off site, local emergency room.”
- ***Delete:** “Contractors and visitors shall report to Sandia Health Services if they have a medical emergency while on Sandia business.”



- ***Add:** “(Security: 720-295-8282)” to TTR site.
- ***Add:** “(Emergency Operations Center : 477-5000)” to the Pantex site.
- ***Delete:** “ Managers at remote locations shall follow the Emergency Preparedness Plan for their location.”

- Under the topic, “Non-Emergency Injuries and Illness”:

- **Add:** “Personnel” and “Action” categories added below “During business hours...”
- **Change:** “Go to the” to “Visit”

- Under the topic, “Reporting Injuries and Illness”:

- ***Add:** “Either the employee, Sandia representative, or SNL contracting officer will notify the company.”
- ***Change:** “Industrial Hygiene” changed to “ES&H Performance Assurance”
- ***Add:** The “Interim Management Notification” process for Sr. Managers.
- **Change:** Emergency Medical Technician (EMT) to Medical Department Paramedics (MDP).

- Under the topic, “Bloodborne Pathogens”:

- **Change:** “...the Emergency Hotline” to “call the Emergency phone number” and

“Non-emergency Hotline” to “Non-emergency phone number”.



- Under the topic, “Return to Work”:
 - ***Clarification:** Re-worded all the text under topic and sub topics.
- Under the topic, “Medical Monitoring/Surveillance”:
 - **Clarify:** Guidance.
 - **Add:** “ Inclusion in the Beryllium Medical Surveillance Program is voluntary when employees are exposed or potentially exposed to airborne Beryllium regardless of the exposure level.”
- Under the topic, “Medical Examinations/Evaluations”:



- **Add:** “Preplacement.”
- ***Change:** “ Complete a Job Placement Assessment ... “The manager shall consult the [Job Accommodation Specialist \(JAS\)](#) contact to schedule a JPA.”

to

“Complete a Job Placement Assessment ... The manager shall consult with the [Job Accommodation Specialist \(JAS\)](#) contact to assure the JPA for their workplace is the most current prior to interviews.”

- ***Add:** Information regarding exiting exam upon termination from SNL for employees in certain medical surveillance programs.
- **Change:** Guidance regarding Voluntary Health Care Assessments for SNL/NM and SNL/CA.



- Under the topic, “Substance Abuse Monitoring”:
 - **Clarify:** Who shall be consulted and notified.
 - ***Change:** “ Personnel Assurance Program (PAP), or Personnel Security Assurance Program (PSAP)” to “Human Reliability Program (HRP).”
- Under the topic, “Smoke-Free Workplace”:

- **Clarify:** Policy.

- Under the topic, "Foreign Travel Immunizations":

- **Change:** "Worldwide Emergency Services Information and Member card" to "International SOS – for worldwide emergency services information and member card."

- Under the topic, "Protection of Human Research Subjects":

- ***Add:** "See the HSB website for information on mandatory training."

- Under the topic, "References":

- **Add:** Four DOE orders.

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- ***Add:**

- Close Call/Injury Illness
- Injury/Illness Non-Recordable
- Recordable Injury/Illness
- ***Serious**

Administrative Changes Only April 27, 2006

[Section 1D](#), "Who Does What"

This section was revised to:

- **Change:** The subject matter expert (SME) was updated from Johnny Vaughan to Nancy Linarez-Royce throughout the parent document and all associated attachments.

[Chapter 5](#), "Fire Protection "

This section was revised to:

- Under the topic, “References ”:
 - **Change:** “DOE O 420.1A” to “DOE O 420.1B.”



April 25, 2006

ES&H Manual Issues FR, FS, and FT were posted this date

Chapter 5, "Fire Protection "

Note: (*) asterisk denotes substantive change.

This section was self-assessed on 3/21/06.

This section was revised to:

- **Delete.** Contributor: Michael Edstrom
- **Change.** “...means of egress” and “passage ways” to “exit ways” throughout the document.
 - Under the topic, “Training”:
 - **Change.** “ Members of the Workforce who are responsible for the use and operation of fire protection equipment” to “ Members of the Workforce who are responsible for the use and operation of fire extinguishers.”
 - **Clarify.** Training “of” to “on” halon emission reduction
- Under the topic, “Common Areas, Aisles, and Corridors”:
 - **Clarify.** “Exit ways are not used to store...metal cabinets.” to “...steel cabinets.”
 - **Clarify.** “Storage cabinets located in exit ways are: ...Equipped with swinging steel doors or retractable steel covers “that are to be kept closed when the cabinets are not in use.”
 - **Clarify.** Added, “or access to” to “Furniture or other obstructions are not placed within the required width of exit ways or where they could obstruct the view of “or access to” exit signs, fire alarm strobe lights, manual fire alarm pull stations, or fire



extinguishers.”

- Under the topic, “Fires and Fire Alarms”:
 - **Clarify.** Placed the appropriate note with the corresponding statement.
- Under the topic, “Fire Extinguishers”:
 - ***Change.** Requirements for managers as follows:
Managers shall be responsible for ensuring that the following types of government-owned vehicles assigned to their organization are equipped with 10-pound minimum or 10A 60B C fire extinguishers (secured with brackets):
 - *** Delete. "Note:** Fire extinguishers in common spaces (e.g., corridors, vending areas, auditoriums) may be inspected by cognizant volunteers. Contact [fire protection](#) if you wish to volunteer. It is Facilities' responsibility to inspect fire extinguishers in common areas if no volunteers are found.”
- Under the topic, “Operation of Heat Producing Appliances”:
- **Add.** Refer to Fire Protection Guidance for Strerno® use.

Under the topic, “Storage of Flammable and Combustible Material”:

- **Clarify.** "Store used rags in approved, self-closing metal cans, separate from clean rags. (Used rags that are soaked with flammable or combustible liquids can spontaneously combust".)

Under “References”:

- **Add.** Five new requirements.
- **Add.** One new document to the “Related Documents” list.


Section 6G, "Lasers and Intense Light"

Note: (*) asterisk denotes substantive change.

This section was revised to:


- **Change.** The subject matter expert (SME) was updated from Michael Oborny to Jonathan Snell throughout the parent document and all associated attachments.

- **Change.** The CA Counterpart was updated from Albert Lau to Jamie King throughout the parent document and all associated attachments.
- **Add.** Add “Review Date: April 18, 2006” to the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on this section.
- **Add.** Add the following heading to the Table of Contents: “Deputy Laser Safety Officer (DLSO).”
- **Add.** In the Table of Contents, under “Attachments,” add “6G-1 – DLSOs by Organization.”
- **Add.** In the Table of Contents, under “Attachments,” add “6G-2 – LAS200SPEC - Site-Specific Training Completion Record” and include a link to the associated Word file.
- **Add.** In the Table of Contents, under “Attachments,” add “6G-3 – Laser Safety Self-Assessment Checklist” and include a link to the associated Word file.
- Under topic, “Training”:
 - ***Add.** In first column, second row, under “Need temporary approval to work with class 3b or 4 lasers while waiting to attend LAS200B,” add the following two bulleted sentences to further define the “Work Activity or Role”:
 - Do not use, align or maintain lasers, but may be incidentally exposed to hazards from Class 3b or 4 lasers.
 - Use or may be exposed to beams from high irradiance Class 3a lasers while simultaneously using collecting optics (e.g., telescopes, binoculars, microscopes).
 - ***Add.** Add the following new “Work Activity or Role” in the first column, third row: “Managers or supervisors who have responsibility for employees involved with Class 3b or 4 laser operations.” Add the required training for this new “Work Activity or Role” to be LAS1101 or LAS200B (for SNL/NM) and LAS200C (for SNL/CA). Add the recommended training for both SNL/NM and SNL/CA to be “N/A.”
 - ***Change.** In the first column, fourth row, change the first bullet from “Use or may be exposed to beams from class 3b or 4 lasers” to “Use class 3b or 4 lasers.”
 - ***Add.** Add the following new “Work Activity or Role” in the first column, fifth row: “Members of the Workforce who are required to take LAS200B.” Add the required



SNL/NM training for this new “Work Activity or Role” to be “LAS200SPEC (Site specific training) This site-specific training shall be completed before working independently.” Add the required SNL/CA training to be “LAS200SPEC (Site specific training).” Add the recommended training for both SNL/NM and SNL/CA to be “N/A.”

- Under topic, “Other Qualifications”:

- 
- ***Change.** In first sentence change “Members of the Workforce who have been assigned to routinely work with...” to “Members of the Workforce who have been assigned to work with....”
 - ***Change.** Change the second sentence from “Laser operators shall be trained and authorized by their manager or deputy laser safety officer (DLSO) to operate the laser” to “Members of the Workforce who have been assigned to work with or around a class 3b or 4 laser system shall be authorized by their manager to operate the laser(s).”
 - ***Add.** Add new information concerning site-specific training to include the following: Manager's responsibility, authorization levels, core elements of the training, and the LAS200SPEC site-specific training completion record.
 - **Change.** Under Guidance, in the first sentence, change “At SNL/NM, Members of the Workforce should contact their laser safety officer (LSO) or DLSO...” to “At SNL/ NM, Members of the Workforce should contact the Industrial Hygiene Records Administrator at 844-0469”
 - **Change.** Under Guidance, in the second sentence, change “At SNL/CA, Members of the Workforce should contact the Health Services Department (8527)” to “At SNL/ CA, Members of the Workforce should contact the Medical Department at 284-2980 or 294-2700.”
 - **Change.** Under Guidance, change the second bullet from “Delegate laser safety management duties defined in this section to the DLSO” to “Wherever possible, delegate laser safety management duties defined in this section to the DLSO.”
 - **Delete.** Delete the sentence “Managers or the DLSO should maintain a list of Members of the Workforce who are trained and authorized to operate lasers.”

- Under new topic, “Deputy Laser Safety Officer (DLSO)”:

- 
- ***Add.** Information on the following types of DLSO responsibilities:

- Administrative
- Technical
- Training



- Under topic, "Control Methods for Laser Hazards":
 - ***Change.** Change the first bullet from "All class 3b and 4 laser operations are covered by a technical work document (TWD) unless specifically exempted by the LSO" to "All class 3b and 4 laser operations are covered by a technical work document (TWD) that contains, at a minimum, the requirements outlined in this section as well as those in the Laser Standard Operating Procedure (SOP) [SOP](#). Appendix A of the SOP provides guidance for preparing a TWD."
 - **Change.** Under Guidance, change first sentence from "Members of the Workforce should direct questions regarding" to "Members of the Workforce should." Also change the bullet "Outdoor use of high-power lasers to the LSO" to "Direct questions regarding outdoor use of high-power lasers to the LSO."
 - **Add.** Add the following new bullet under Guidance: "Use this section and the [SOP](#) to develop an OP (TWD) for Class 3b/4 operations."
 - **Delete.** Delete the following bullet from under Guidance: "An exemption for the development of a technical work document for class 3b laser operations to the appropriate LSO or DLSO."
- Under topic, "Laser Safety Reviews":
 - ***Add.** After the second bullet, add the following paragraph: "Managers shall ensure that the outdoor use of any class of laser is coordinated through the LSO to ensure compliance with applicable regulations. This requirement applies if the outdoor use of the laser(s) has the potential for the beam to be directed above the horizon, through navigable airspace, towards airports, landing fields, other aircraft ground operations, or could impact other neighboring operations."
 - ***Change.** Change the sentence "Managers, laser owners, or their designated DLSO shall assist the LSO in conducting a periodic inventory and safety review of class 3b and 4 lasers, and correct any deficiencies noted in the safety review" to "Managers, laser owners, or their designated DLSO shall ensure that all Class 3b and 4 lasers systems (including embedded Class 1 systems) are registered in the corporate laser inventory, assist the LSO in conducting Annual Laser Safety Audits on these systems, and correct any deficiencies noted in these audits."



- ***Add.** Add the following sentence: “Annual Laser Safety Audits include:” followed by the bulleted information.
- ***Add.** Add the following sentence: “Managers shall evaluate the individuals within their organizations who mentor or otherwise oversee students.”
- **Add.** Add the following guidance: “The [Laser Safety Self-assessment Checklist](#) contains specific guidelines for use during line management self-assessments. Use of this checklist during management self-assessments will help ensure that active oversight of laser operations is taking place and being documented. Managers should utilize this checklist to conduct self-assessments of their laser operations and to evaluate those who mentor students.”
- Under topic, “References”:
 - ***Change.** Under “Requirements Source documents” change both dates listed in requirement “ACGIH TLVs” from “2004” to “2005.”
 - ***Add.** Under “Requirements Source documents” add the following requirement “Department of Energy Special Operations Report (SOR): Laser Safety Expectations SOR 2005-01.”
- **Add.** Add Attachment “6G-1 – DLSOs by Organization.” This chart lists all the DLSOs by organization and provides their associated contact information.
- ***Add.** Add Attachment “6G-2 – LAS200SPEC - Site-Specific Training Completion Record.” This attachment provides a brief explanation of the significance and requirements of filling out a site-specific training completion record and provides a link to the associated Word file.
- **Add.** Add Attachment ” 6G-3 – Laser Safety Self-Assessment Checklist.” This attachment provides a brief description of the usage of this checklist along with a link to the associated Word file.

[Section 10L](#), "Management of Excess Metallic Lead"

Note: (*) asterisk denotes substantive change.

Note: The following changes, although they include substantive changes, are being made

without formal review from the ES&H Manual Committee and the General reviewers, at the request of Sandia's Legal Department in accordance with a stipulated agreement.

- Under topic, "Indoor Handling and Storage,"
 - ***Add.** Requirements for indoor storage of metallic lead as follows:

"Metallic lead shall be stored in a container or designated area when not in use. The area or container shall be labeled as "Lead for Reuse." Metallic lead shall be labeled "excess lead" if the following situation is true:"



Administrative Changes Only April 14, 2006

[Section 18G](#), "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances"

This section was revised to:

- **Delete:** Francine Vigil as a contributor.
- **Add:** Darlene Moore as a contributor.

- Under topic, "References":

- **Add:** Under "Implementing Documents," add SNL, CPR400.1.3, "Price-Anderson Amendments Act (PAAA) and Nuclear Safety Requirements."
- **Replace:** From under "Related Documents," replace DOE M 232.1•1, "Occurrence Reporting and Processing of Operations Information," with DOE M 231.1•2, "Occurrence Reporting and Processing of Operations Information."
- **Delete:** From under "Related Documents," delete DOE O 232.1, "Occurrence Reporting and Processing of Operations Information."
- **Add:** Under "Related Documents," add DOE O 231.1A, "Environment, Safety, and Health Reporting."

- In Attachment 18G-1:

- **Delete:** In Figure 18G-1 (Flowchart of Nonconformance Reporting Process), step 3, delete the box containing the text "Recorded in Web SIMS" and also delete the



attaching arrows.

- **Change:** In Figure 18G-1 (Flowchart of Nonconformance Reporting Process), step 4, last box, changed “.., recorded in WebSIMS and Sandia PAAA Access Database” to “.., recorded in Sandia PAAA Access Database.”

Administrative Changes Only April 11, 2006

Section 10J, "Registering, Naming, and Labeling Bulk Storage Tanks"

This section was revised to:

- **Change.** Subject Matter Expert from Sylvia Saltzstein to Randy Castillo
- **Delete.** UCI from SF 2001-STR form.

Under the topic “Related Hazards and Activities”:

- **Change.** Title of Section 6U to “Chemical Barcoding and Inventory”
- **Change.** Title of Section 10F to “Oil and Fuel Storage”

Under the topic “References”:

- **Change.**
 - 40 CFR 300-372, *Emergency Planning and Community Right-to-Know Act (EPCRA)*.
 - to
 - 40 CFR Subchapter J - Superfund, Emergency Planning, and Community Right-to-Know Programs (Parts 300--399).
- **Change.**
 - National Fire Protection Association (NFPA), *Fire Prevention Code*, 1997.
 - to

- Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (42 U.S. Code 11001 et seq.).
-

April 3, 2006

Section 10F, "Oil and Fuel Storage"

This section was self-assessed March 10, 2006.

Note: Over 75% of this section is either new or has changed and should be read in its entirety.

ES&H Manual Glossary

- **Add:**

- *SPCC Plan
- *Aboveground oil-storage tank (AST)
- *Underground oil-storage tank (UST)
- *Bulk storage container
- *Oil

March 30, 2006

Section 10L, "Management of Excess Metallic Lead"

Note: (*) asterisk denotes substantive change.

Note: The following changes, although they include substantive changes, are being made without formal review from the ES&H Manual Committee and the General reviewers, at the request of Sandia's Legal Department in accordance with a stipulated agreement.

This section was revised to:

- ***Change:** The California Counterpart was updated from Janet Harris to Mark Brynildson



throughout the document.

- Under Applicability,
 - ***Add.** Metallic lead shall be deemed excess when there is no current, planned, or proposed use.
- Under Outdoor Handling and Storage,
 - ***Add.** Requirements for labeling, "Lead for Reuse."
- Under Indoor Handling and Storage,
 - ***Delete.** Requirements for not labeling, "Lead for Reuse" and stipulations for labeling.



Administrative Changes Only March 21, 2006

Section 4C, "Lockout/Tagout (LOTO)"

This section was revised to:

- Under the topic, "Procedures,"
 - **Delete:** The word "only" was deleted from the "Written LOTO Procedure."



Administrative Changes Only March 17, 2006

Section 22D, "Corrective Action Development, Verification of Completion, and Validation of Effectiveness "

This section was revised to:

Under the topic "Training and Qualifications":

- **Delete:** "Note: If DOE/SSO has independently verified or validated a corrective action, additional verification/validation is not required." Following Table 2 in "Requirements."

Under the topic "Processes":

- **Delete:** "(If DOE/SSO has independently verified a corrective action, additional verification does not have to be performed)" In item 4, element a), fourth bullet, in "Verification of Corrective Action Completion."
- **Delete:** "If DOE/SSO has validated a corrective action, an additional validation is not required." In item 3, in "Validation of Corrective Action Effectiveness."

March 16, 2006

[Section 10C](#)," Migratory Birds, Protected Species, and Other Biota "

Note: (*) asterisk denotes substantive change.

This section was revised to:

- **Add:** Review Date to the header to indicate that an ES&H Manual Self Assessment (SA) was recently completed on March 7, 2006.
- **Under topic, "Work Activity Planning":**
 - ***Change:** requirement that states "Prior to mowing in undeveloped grassland areas of the SNL/CA site, consult the ecology contact as directed in the SNL/CA Weed Abatement Procedure" to "Prior to mowing in undeveloped grassland areas of the SNL/CA site, consult the ecology contact to identify specific areas of sensitivity."
 - ***Add:** requirement that states: "Members of the Workforce shall: Initiate the migratory bird and protected species compliance process before or at the same time as the DOE and U.S. Air Force NEPA compliance processes (see CPR400.1.1/MN471001, ES&H Manual, Section 10B, "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties"). For NEPA compliance processes, consult the NEPA specialist."
 - **Delete:** guidance that states: "Initiate the migratory bird and protected species compliance process before or at the same time as the DOE and U.S. Air Force NEPA compliance processes (see CPR400.1.1/MN471001, ES&H Manual, Section 10B, "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties"). For NEPA compliance processes, consult the NEPA specialist."

- Under topic, "Pest Control and Feral Animals":
 - ***Change:** requirement that states "Not feed or attract feral animals, including birds" to "Not feed or attract wildlife including feral animals and birds."
 - **Change:** update link [Site Requirement for Interactions with Wildlife](#) which provides a complete text of SNL/CA's site requirements and background information.
 - **Change:** guidance on SNL/CA contact to call for additional guidance on Hantavirus and clean up of rodent droppings, dead rodents, and nesting material from "ES&H Hotline (294-3724) for additional guidance" to "Maintenance Trouble Line (294-6400) to clean up rodent debris."

- Under topic, "References":
 - ***Change:** requirement reference "California Fish and Game Code, Division 3, Chapter 1.5, Section 2050-2068, California Endangered Species Act" to "California Fish and Game Code."
 - ***Delete:** requirement reference "California Fish and Game Code, Division 2, Chapter 4, Wildlife Conservation Law of 1947."
 - **Delete:** implementing document "SNL, PG470103, Environmental Monitoring and Surveillance Program."
 - **Add:** implementing document "SNL, PG470224, Environmental Management Operating Plan."
 - **Delete:** related document reference "DOE 5400, 1, Chg. 1, General Environmental Protection Program."
 - **Add:** related document reference "DOE O 450.1, Chg. 1, Environmental Protection Program."

March 15, 2006

[Section 4C](#), "Lockout/Tagout (LOTO)"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- Substantive changes for issue "N" were reviewed through ES&H Policy Sponsor-driven Kaizen on February 24, 2005.

- Under Tools,

- ***Add:** Group LOTO procedure and Tool for Performing Periodic Inspection (LTO230) was added to the list.
- **Change:** The titles of LOTO tools were updated and reorganized according to order of importance.

- Under topic, "Scope and Applicability":

- ***Change:** Scope and Applicability was revised to clarify this section will not cover, "Work on single-energy-source cord- and plug-connected electrical equipment on which the exposure to hazardous energy is controlled by unplugging the equipment from the source and the plug remains in the exclusive control of the [authorized worker](#)."

- Under topic, "Roles and Responsibilities":

- ***Delete:** LTO210, initial LOTO training.
- ***Delete:** LTO210R, refresher LOTO training.
- ***Delete:** Procedure specific training on current, reviewed procedures.
- ***Delete: Requirements for managers to:**
 - Conduct an annual review of roles and responsibilities
 - Conduct annual inspections (as appropriate).
- ***Add:** A requirement for servicing contractor personnel engaged in activities that shall meet the requirements of LOTO, will include "[Members of the Workforce](#)" in addition to outside servicing personnel.

- ***Add:** Instructions for LTO tracking.

- Under topic, "Members of the Workforce":

- ***Add:** [LTO210](#), LOTO for Authorized Workers (every 3 years).
- ***Add:** [LTO220](#), LOTO Annual Roles and Responsibilities (at least once per year).
- ***Add:** [LTO230](#), Training for Authorized Workers.

- Under topic, “General Requirement”:

- ***Change:** A typo was corrected to change the title from CPR400.1.1.7/[GN470037](#), *Administrative Locks and Tags* to *Administrative Control Procedure*.

- Under topic, “Procedures”:

- ***Change:** Step four was revised to specify that tagout devices used in place of lockout devices are used only when the energy-isolating device is not capable of being physically locked out. A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by using a lock. Contact the LOTO SME for assistance was added to conclude step four.

- ***Delete:** Authorized worker

- ***Change:** Steps seven through ten were combined.

- ***Add:** The following steps to number seven:

- **Make Work area safe.**

- Inspect the work area to ensure that all Members of the Workforce have been removed from the hazard area.

- Under topic, “Testing or Positioning of Machines, Equipment, or Components Procedure”:

- ***Change:** Section was modified to specify, “authorized worker.”

- Under topic, “Group LOTO Procedure”:

- ***Add:** “Authorized workers shall ensure that:” was added as a heading for step one.

- ***Add:** “All energy sources are-de-energized, isolated, locked out and tagged out,

as appropriate, and zero energy state is verified” was added to step one.

- ***Add:** Information on coordinating the group LOTO activity.
- ***Delete:** "Re-energize the machine or piece of equipment" was deleted from step four.
- ***Add:** "Authorize the restart of the machine or piece of equipment by normal means or proceed to "Testing or Positioning of Machines, Equipment, or Components Procedure" was added to step four.

- **Under topic, "Written LOTO Procedure":**

- ***Change:** Authorized worker(s) has exclusive control of the LOTO device.
- ***Add:** No previous accidents have occurred with the equipment during service or maintenance.
- ***Add:** Directions for writing procedures.

- **Under topic, "Related Hazards and Activities":**

- ***Change:** A typo was corrected to change the title from CPR400.1.1.7/[GN470037](#), *Administrative Locks and Tags* to *Administrative Control Procedure*.

- **Under topic, "References":**

- **Add:** <http://LOTO.Sandia.Gov>, LOTO User Web Interface

- **In Attachment 4C-1, "LOTO CATALOG":**

- ***Change:** The title was changed from Lockout/Tagout Contact, Device, and Sign Information to Lockout/Tagout (LOTO) Catalog.
- **Delete:** "New tags are being designed."

Administrative Changes Only
March 10, 2006

Section 4T, "Firearms Safety"



Note: (*) asterisk denotes substantive change.

This section was revised to:

- Under topic, "General Firearms Safety":
 - **Change:** DOE M 440.1-1, DOE Explosives Safety Manual to DOE M 440.1-1A, Doe Explosives Safety Manual.
- Under topic, "Storage and Transportation of Firearms and Munitions":
 - **Change:** CPR400.3.15, Locks, Keys, and Combinations to CPR400.3.15, Locks and Keys.
- Under topic, "References":
 - **Change:** DOE O 232.1A, Occurrence Reporting and Processing of Operations to DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information
 - **Change:** CPR400.3.15, Locks, Keys, and Combinations to CPR400.3.15, Locks and Keys.
- Under "Attachment 4T-2":
 - **Change:** DOE O 232.1-1A, Occurrence Reporting and Processing of Operations to DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information.
- Under "Attachment 4T-4":
 - **Change:** The SME from Willie Johns to Danny Donald.



**Administrative Changes Only
March 9, 2006**

[Section 18C](#), "Occurrence Reporting"

This section was revised to:

- **Change.** Change the Review Date in the header to indicate that an ES&H Manual Self-Assessment (SA) was completed on March 6, 2006.



- Under topic, "References":

-

Delete. From under "Requirements Source Documents," delete DOE O 232.1A, DOE M 232.1-1A, and the Note. These two DOE orders have been cancelled and the contract has been modified to delete the reference to the requirements in these cancelled orders.

-

In Attachments 18C-1, 18C-2, 18C-3, and 18C-4:

- **Add.** Add the new Review Date to the header.



- In Attachment 18C-3:

- **Delete.** Delete Casey Von Barga as a contributor.

Administrative Changes Only March 9, 2006

[Section 22B](#), "Root Cause Analysis (RCA)"

(*) asterisk denotes substantive change.

This section was revised to:



- Under the topic "Requirements Source Documents":
 - **Change.** "DOE M 232.1-1A, *Occurrence Reporting and Processing of Operations Information.*" to "DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information.* "
 - **Change.** "DOE O 232.1A, *Occurrence Reporting and Processing of Operations*

Information." to "DOE O 231.1A, *Environment, Safety, and Health Reporting.*"



Administrative Changes Only
March 8, 2006

Section 6S, "Toxic Substances Control Act (TSCA)"

This section was revised to:

- **Change:** The subject matter expert (SME) was updated from Jeff Downs to Katie Moore, throughout the parent document and all associated attachments.



Administrative Changes Only
March 8, 2006

Section 22A, "ES&H Line Self-Assessment (SA) Activities"

This section was revised to:

- Under topic, "Roles and Responsibilities":
 - Clarify: the use of the word "report" and replace it with the word "share" to more accurately reflect the exercise regarding SA results, as specified by Steve Rottler in e-mail correspondence to Becky Krauss (dated 02/14/06). This replacement is for all levels of responsibility for Executive Management through Members of the Workforce.



March 6, 2006

Section 17B, "Air Permits"

Note: (*) asterisk denotes substantive change.

This section was revised to:

- ***Delete:** the phrase “in Bernalillo County, New Mexico” from the title.
- ***Change:** the California Counterpart in the header to “Lee Gardizi” from “N/A.”



- Under the topic “Applicability”:

- ***Change:** “pollutants” to “contaminants” in the second paragraph.
- ***Change:** “air pollutant permits” to “work activities that have the potential to emit any regulated air contaminant outside of Bernalillo County, New Mexico” in the third paragraph.
- ***Add:** “ For work activities that have the potential to emit any regulated air contaminant at Sandia-controlled premises in California, consult the California air quality contact.” as the fourth paragraph.

- Under the topic “Planning”:

- **Change:** “pollutant” to “contaminant” in two places in “Requirements.”
- **Add:** “calculation of emission rates and for guidance on” to the note at the end of “Requirements.”
- **Add:** “applicability” between “permit” and “determination” in the note at the end of “Requirements.”



- Under the topic “Permitting Process”:

- **Add:** “responsible for complying with the conditions and requirements of a permit” after “Members of the Workforce” and before “shall” in “Activities” under “Requirements.”

- Under the topic “Fugitive Dust Control/Demolition Permit”:

- **Add:** “ Note: For SNL/NM wind direction or speed information, see <http://132.175.200.42/CAN.HTML> or contact Meteorologist ([air quality contact](#)).” after the third bullet in “Requirements.”



- Under the topic “Open Burn”:
 - **Add:** “ Not burn explosives considered and regulated as a hazardous waste subject to Section 19A, “Hazardous Waste Management,” of the ES&H Manual” as the third bullet after “Members of the Workforce shall:” in “Requirements,” under “Prohibited and Accidental Burning.”
 - ***Add:** “ Explosives may be considered and regulated as a hazardous waste subject to Section 19A, “Hazardous Waste Management,” of the ES&H Manual.” at the end of the last paragraph of “Requirements” under “Open Burn Permit.”



- Under the topic “Related Hazards and Activities”:
 - ***Add:** a row to the table in the topic “Related Hazards and Activities”: The content of the first cell in the row is “Explosives” and the content of the second (last) cell in the row is “ Section 19A, “Hazardous Waste Management””

[Attachment 17B-1](#), “Giving Notice”

- ***Change:** the California Counterpart in the header to “Lee Gardizi” from “N/A.”
- Under the topic “Applicability”:
 - ***Change:** “pollutants” to “contaminants” in the second paragraph.
 - ***Delete:** “air pollutant permits” and add the phrase “work activities that have the potential to emit any regulated air contaminant outside of Bernalillo County, New Mexico” to the third paragraph.
 - ***Add:** “ For work activities that have the potential to emit any regulated air contaminant at Sandia-controlled premises in California, consult the California air quality contact” as the fourth paragraph.



[Attachment 17B-2](#) , “Getting a Permit”

- ***Change** the California Counterpart in the header to “Lee Gardizi” from “N/A.”
- Under the topic “Applicability”:
 - ***Change** “pollutants” to “contaminants” in the second paragraph.
 - ***Change:** “air pollutant permits” to “work activities that have the potential to emit



any regulated air contaminant outside of Bernalillo County, New Mexico” in the third paragraph.

- ***Add:** “ For work activities that have the potential to emit any regulated air contaminant at Sandia-controlled premises in California, consult the California air quality contact” as the fourth paragraph.
- Under the topic “Required Permits”:
 - ***Change:** “submit the permit application” to “provide information” in Step 2 in the table under “Requirements.”
 - ***Add:** “in order to complete the permit application” after “air quality contact” in Step 2 in the table under “Requirements.”



[Attachment 17B-3, “Open Burn Notification”](#)

- ***Change** the California Counterpart in the header to “Lee Gardizi” from “N/A.”
- Under the topic “Applicability”:
 - ***Change:** “pollutants” to “contaminants” in the second paragraph.
 - ***Delete:** the phrase “air pollutant permits” and add the phrase “work activities that have the potential to emit any regulated air contaminant outside of Bernalillo County, New Mexico” to the third paragraph.
 - ***Add:** the sentence “ For work activities that have the potential to emit any regulated air contaminant at Sandia-controlled premises in California, consult the California air quality contact” as the fourth paragraph.
- Under the topic “Prior Notification”:
 - ***Add:** “DOE,” after the telephone number in Step 2 in the table under “Requirements.”



ES&H Manual Glossary:

- ***Add** the following items to the Glossary:
 - ***Hazardous air pollutant (HAP)**



- *Regulated air contaminant
-

Administrative Changes Only March 1 , 2006

Section 10B, "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties"

This section was revised to:

- **Add:** Add a Review Date to the header to indicate that an ES&H Manual Self Assessment (SA) checklist was completed on this section. No deficiencies were found (i.e. – all SA questions were marked “Yes”) and therefore no other changes are required.
-



February 14 , 2006

Section 4J, "Material Handling - Cranes, Hoists, and Forklifts"


Note: (*) asterisk denotes substantive change.

This section has changed substantially and should be read in its entirety.

This section was revised to:

- ***Add:** To the Table of Contents the following items:
 - Wire Rope and Slings
 - Construction Hoisting and Rigging Equipment
 - Miscellaneous Lifting Devices
 - Program Revision Guidance
- Under topic, “Applicability”:
 - ***Add:** the statement, “This section does not apply to the procurement and management of construction or construction-like activities from private contractors or suppliers.”




- 
- ***Add:** the requirement for employees operating cranes and hoists, handling rigging or working around any material handling equipment to work with caution, which includes not:
 - Working under or near suspended loads.
 - Keeping fingers away from pinch points.
 - Using tag lines as much as possible.
 - Understanding that they are responsible for the lift and that anyone can stop a lift if a hazardous situation is observed.
 - Wearing Proper PPE (the hazard of the lift will determine level of protection needed).
 - Additional cautions for mobile cranes.



- Under topic, “Training & Qualifications”:

- ***Add:** Training requirements for Operators of miscellaneous lifting devices, including a new recommended course, RGH137.
- ***Add:** Requirement for SNL mobile crane operators to comply with Hoisting Operators Safety Act (HOSA).
- ***Add:** Training requirements for Crane and Hoist Inspectors and Maintenance personnel.
- ***Add:** Training recommendations for Sandia SMEs.

- Under topic, “Inspections and Maintenance”:

- 
- ***Add:** additional equipment for inspection, including:
 - Overhead cranes and hoists (Includes manual-lever hoists) (pre-use and monthly inspections).
 - Rigging accessories (initial, pre-use, and annual inspections).
 - Slings (initial, pre-use, and annual inspections).

- Miscellaneous Lifting equipment (initial, pre-use, and annual inspection.
- ***Add:** Miscellaneous lifting equipment to list of equipment for inspection and maintenance by equipment owners.



- Under topic, “Procurement of Material Handling Equipment”:

- ***Add:** Hoists to the acquisition process.
- ***Add:** Requirements for acquisition:
 - Before ordering, review Appendix (A) Procurement Guidelines in DOE Technical Standard 1090-04.
 - Miscellaneous Lifting Devices (See Appendix A DOE-STD-1090-04).
 - Suggest ordering all lifting devices to meet DOE, OSHA and ANSI standards.
 - Under “Guidance” add Quality-Significant purchasing.
- ***Delete:** Organization 7821 for “Electrical and Structural Engineering.”



- Under topic, “Recordkeeping”:

- ***Add:** requirement for “cranes, hoists, and rigging gear.
- **Delete:** Under "Personnel Lifts" delete statement "life of equipment from 3 years" to "duration of employment."

- Under topic, “Critical Lifts”:

- ***Add:** additional responsibilities for managers, including:
 - An appointed person shall classify each lift into one of the DOE categories (ordinary, critical, or pre-engineered production) prior to planning the lift.
 - A lift shall be designated critical if any of the following conditions are met.



- i. The load item, if damaged or upset would result in a release into the environment of radioactive or hazardous material exceeding

the established permissible environmental limits.

- ii. The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility or project operation.
- iii. The cost to replace or repair the load item, or the delay in operations of having the load item damaged would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.
- iv. A lift not meeting the above criteria shall also be designated critical if mishandling or dropping of the load would cause any of the above noted consequences to nearby installations or facilities.
 - Further site-specific criteria may be developed to supplement those cited above and may include loads which require exceptional care in handling because of size, weight, close-tolerance installation or high susceptibility to damage as well as lifts using multiple pieces of lifting equipment.”

- ***Delete:** Definition for “Critical Lift” from text.

● Under topic, “Hoists”:

- ***Add:** the following type of equipment:
 - Overhead hoists (underhung).
 - Jib cranes/hoists (floor and wall mounted).
 - Monorail systems.
 - Manual-lever-operated hoists (wire rope, chain, and web-strap types).
 - Wire-rope ratchet and pawl lever-operated hoists should not be used for lifting service (see Figure 8-8).
 - Systems used for transporting personnel and specially insulated hoists used for handling electrically energized power lines require special considerations and are not included in this chapter.

Note: These lifting devices require: Initial, pre-use, and periodic (annual) inspections.

- Under topic, “Mobile Cranes”:
 - ***Change:** Link to Federal Aviation Form 7460-1.
 - ***Add:** Wire Rope and Slings to include DOE requirements and additional responsibilities for Sandia managers.
 - ***Add:** Site Specific Requirements for Sandia and CA.
- Under topic, “Forklift Trucks ”:
 - ***Delete:** the statement "Members of the Workforce may use FOP 99-05 as an operational guide."
- Under topic, “Construction Hoisting and Rigging Equipment”:
- ***Add:** Construction Hoisting and Rigging Equipment to include DOE requirements.
- Under topic, “Below the Hook Lifting Devices ”:
 - **Delete:** the statement "If a load bearing element is modified or repaired, a qualified inspector should conduct an initial inspection and complete a proof test."
- Under topic, “Miscellaneous Lifting Equipment”:
- ***Add:** Miscellaneous Lifting Equipment to include DOE requirements.
- ***Add:** “Program Revision Guidance” for SMEs.
- Under topic, “References”:
- ***Change:** DOE Technical Standard from 1090-99 to 1090-04.
- Under topic, “Attachment 4J-1”:
- ***Add:** A load test requirement for Below-the-hook lifting Devices when used in critical lifts.
- ***Add:** Inspection requirements for “Vacuum or magnet lifters.”

- ***Add:** Section for required inspections for “Miscellaneous Lifting Devices.”
- Under topic, “Attachment 4J-2”:
 - ***Add:** Additional steps and requirements for “Analyze Hazards.” (See Attachment)
 - ***Add:** requirements and responsibilities for “Pre-engineered Production Lifts.”
 - ***Delete:** Responsibility of manager for verifying that when repetitive critical lifts are performed the probability of dropping, upsetting, or colliding is reduced by 6 factors. Now “Pre-engineered Production Lifts.”
 - ***Add:** Attachment 4J-3 – Examples of Critical Lifts
 - Attachment 4J-4 – Examples of Suspended Load Hazards
 - Form SF2001-MLD – Miscellaneous Lifting Devices Inspection Form
 - SF 2001-FOC, Frequent Inspection Form Overhead Cranes
 - SF 2001-POC, Pre-Use Inspection Form Overhead Cranes
 - SF 2001-FIH, Frequent Inspection Form Hoists
 - SF 2001-FMC, Frequent Inspection Form Mobile Cranes
 - SF 2001-PIH, Pre-Use Inspection Form Non-Mandatory Hoists
 - SF-2001-VDL, Vacuum Lifting Devices Inspection Form
 - SF-2001-VDL, Below-the-Hook Lifting Devices Inspection Form
 - ***Delete:** Sandia Form 2001-IMC from Web.
- Under “**ES&H Glossary**”:
 - ***Add:** the following terms:
 - **Shop Crane**
 - **Proof Test**



- **Pre-Engineered Production Lifts**
- **Person-in-Charge (Material Handling – Cranes, Hoists and Forklifts)**
- ***Change:** Definition for “**Critical Lift**” in ES&H Glossary.

February 9 , 2006
Administrative Changes Only

Section 4C , "Lockout/Tagout (LOTO) "

This section was revised to:

- **Change:** Issue “L” was reviewed by Kaizen on November 8-11, 2004 and subsequently the issue letter was updated to “M.” The changes were approved on December 15, 2004 by the LOTO Committee. Notification was made through: *State of the Labs* on January 7, 2005, *Lab News* on January 21, 2005, and *Sandia Daily News* on February 23, 2005.
- **Change:** A typo was corrected within Attachment 4C-1 to change the issue letter from “N” to “M.”
- **Change:** The subject matter expert (SME) was updated from Steve Walcott to Mark Warner, throughout the parent document and all associated attachments.

February 8 , 2006
Administrative Changes Only

Chapter 11 , "ES&H Training "

This chapter was revised to:

- **Change:** the CA Counterpart from Lorin Kiefer to Gwendolyn Mosley.
- **Delete:** Carla Forrest as a contributor.
- **Add:** Deborah Espinosa as a contributor.
- **Add:** Linda Wilson as a contributor.

- Under topic, "Applicability":

- **Add:** link to definition of "[Members of the Workforce](#)" in the *ES&H Manual Glossary*.
- **Change:** In the last paragraph change "Attachment 11-1" to "Attachment 11-2" and then link it to [Attachment 11-2](#).

- Under topic, "Corporate-, Program Owner-, and Organization-Managed ES&H Training":

- **Change:** In the note under the third bullet, change "Attachment 11-2" to "Attachment 11-1" and then link it to [Attachment 11-1](#).

- Under topic, "Organization-Managed ES&H Training":

- **Delete:** In the first note listed under Guidance, delete the sentence "The manager may petition for equivalency of training, but it is not guaranteed."

- **Add:** Under Initial Establishment of an OJT (which is listed under Guidance), add a parenthetical reference to Attachment 11-3 – On-The-Job (OJT) Procedure and link it as follows: "At a minimum, standardized OJT should be conducted using this six-step OJT/demonstration process Attachment 11-3 for a more detailed example)."

- Under topic, "Instructor Qualification":

- **Change:** Under Guidance, change "Course: Sandia's BIT100," to "Course Instructors: Sandia's BIT100," and change "OJT: Sandia's OJT100," to "OJT Instructors: Sandia's OJT100,"

January 24 , 2006
Administrative Changes Only

[Chapter 5](#), "Fire Protection "

This section was revised to:

- Under the topic, "Smoking":

- **Clarify:** requirements for Members of the Workforce to smoke only in parking lots or designated smoking areas (DSAs) at Sandia/California.

January 11 , 2006

Section 22E, "Environment, Safety, and Health and Emergency Management Corrective Action Management Program (CAMP) "

This section is new and should be read in its entirety.

ES&H Manual Glossary:

Note: (*) asterisk denotes substantive change.

● **Add:**

- *Assessment/Survey/Audit
- *Corrective Actions Tracking System (CATS)
- *Change Control Board (CCB)
- *Corrective Action Plan (CAP)
- *Corrective Action Management Program (CAMP)
- *Corrective Action Management Program (CAMP) Project Lead
- *Evidence Package
- *Finding (12870 Issue)
- *Milestone
- *Observation/Opportunity for Improvement (OFI)
- *Office of Independent Oversight and Performance Assurance (OA)
- *Verification

**Administrative Changes Only
January 9 , 2006**

[Section 6D](#), "Hazard Communication Standard"

This section was administratively revised to:

- **Add:** Haz215 to Recommended Training.
- **Replace:** Upgraded HAZ101I to HAZ101.



[Bob Goetsch](#) - Content

[IMT](#) - Web Provider



ES&H Manual

* ATTACHMENT 1D-3 – STANDING ES&H COMMITTEES



Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)

MN471001, Issue P (O not used)

Revision Date: [May 25, 2007](#); Replaces Document Dated: June 28, 2006

Administrative Changes: June 8, 2007, and [July 2, 2007](#)

Committee	Chair	Purpose
ES&H Issues Management Review Committee	Heidi Herrera	Reviews potential "issues" and provides advice and guidance to SME's and management on "issues" identified through the ES&H Issues Management System.
SNL/CA Institutional Biosafety Committee	Stephanie Ball	Reviews and approves recombinant DNA research activities covered by NIH guidelines, proposed work requiring Biosafety Level 2 containment, select agent work, and work with biohazardous agents for safe handling practices and compliance with ES&H-related requirements and policies.

 <p>SNL/NM Institutional Biosafety Committee</p>	<p>Grant Heffelfinger</p>	<p>Review and approve recombinant research activities covered by NIH guidelines, any proposed work with Risk Group 2 (RG2) agents and/or Select Agents for safe handling practices and compliance with ES&H-related requirements and policies, and recommending approval of work as appropriate.</p>
<p>Construction Safety Standing Committee (CSSC)</p>	<p>*Jeffrey P. Quintenz</p>	<p>The Committee is a decision group that provides safety oversight of all construction and construction-like work at Sandia-controlled premises performed through contracts.</p>
 <p>Electrical Safety Standing Committee (ESSC)</p>	<p>David W. Corbett</p>	<p>Provide corporate oversight of line implementation of the electrical safety program including: regulatory compliance; tracking and trending of metrics, occurrence and non-compliance data; review and assessment of line implementation; and review of identified issues through audits or as identified by the Issues Management System. The committee functions as an advisory committee.</p>
<p>Electrical Safety Functional Committee (ESFC) (charter)</p>	<p>Mark McNellis</p>	<p>Provide technical resource for identifying, communicating, and recommending resolution of electrical safety issues.</p>
<p>Explosives Safety Committee (charter)</p>	<p>Thomas Blejwas</p>	<p>Provide review, interpretation, and revision of the Explosives Safety Program.</p>



Hoisting & Rigging Safety Committee (charter)	Darrell Fong	Provide guidelines for safe hoisting and rigging practices at SNL.
Joint Firearms Safety Committee (charter)	Michael Hazen	Monitor compliance with applicable DOE orders and enhance firearms safety throughout SNL.
Pressure Safety Committee (charter)	Roger Shrouf	Provide oversight for safety of pressure systems at SNL.
Sandia Nuclear Criticality Safety Committee (SNCSC) (charter)	Thomas A. Mehlhorn	Provide safety oversight of the use of materials with criticality potential (except reactor facilities).
Sandia Nuclear Facilities Safety Committee (NFSC) (charter)	Thomas Blejwas	Responsible for the implementation of the Sandia Internal Review and Appraisal System (SIRAS) review, recommendation, and appraisal functions.
Sandia Radiation Protection Safety Committee (RPSC) (charter)	Keith M. Matzen	Provide radiological safety oversight and maintain the MN471016 , <i>Radiological Protection Procedures Manual</i> .
SNL/CA Safety, Health & Environment Advisory Committee (SHEAC)	Terry Michalske	Perform site ES&H self-assessments and advise the SNL/CA ES&H Council (SCEC) on ES&H issues.
Traffic Safety Committee (charter)	Darrell Fong	Monitor traffic-related issues and projects; recommend improvements, resolution, or approval as necessary.
Union Management Safety Committee	Darrell Fong	Survey, analyze, and recommend resolutions of ES&H concerns of bargaining units.



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SECTION 4A – WORKING IN HIGH-INJURY-POTENTIAL/REMOTE OPERATIONS

Subject Matter Expert: [Stephen Warner](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue D

Revision Date: [August 18, 1997](#); Replaces Document Dated: N/A

Review Date: September 16, 2004

Administrative Changes: April 2, 2004, September 17, 2004, August 10, 2006, and [July 2, 2007](#)



* Indicates a substantive change

- [Applicability](#)
- [High-Injury-Potential Operations](#)
- [Working Alone](#)
- [Medical Services and First Aid](#)
- [Related Hazards and Activities](#)
- [References](#)

APPLICABILITY



For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who perform [high-injury-potential operations](#) alone, in a normally unoccupied remote facility, or in a [remote location](#).

HIGH-INJURY-POTENTIAL OPERATIONS



Requirements

Members of the Workforce shall:

- Always use the [buddy system](#) when working at a [high-injury-potential operation](#). (See "[Related Hazards and Activities](#)" section.)
 - **Not** leave a [high-injury-potential operation](#) unattended unless appropriate control measures have been established to keep unauthorized and casual [Members of the Workforce](#) out of harm's way.
-

WORKING ALONE



Requirements

Managers shall authorize Members of the Workforce to work alone in a [normally unoccupied remote facility](#) or in a [remote location](#) only if one or more of the following applies:

- The injury potential of the task is low.
- Electronic surveillance (visual, audio, etc.) is available to monitor the member of the workforce.
- A definite follow-up schedule is established in advance by the manager or **identified in an applicable technical work document (TWD)** and maintained during the work **activity** such as:

- Members of the Workforce call in periodically.
- The manager (or designee) visits the area regularly to check on the well-being of **Members of the Workforce**.

MEDICAL SERVICES AND FIRST AID

Requirements

Members of the Workforce responsible for the operation at a [normally unoccupied remote facility](#) or [remote location](#) shall ensure that:

- Emergency assistance is reasonably accessible during all [high-injury-potential operations](#). (This does not mitigate the above-stated requirement for using the [buddy system](#), when appropriate.)
- Where emergency assistance is not readily available, alternative means of response, such as another person trained in **cardiopulmonary resuscitation (C.P.R) and first aid**, are considered based on the risk and potential hazards.

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Pressure or vacuum	Section 4D , "Pressure Safety Operations"
Hot work	Section 4E , "Hot Work Safety"
Hazard communication	Section 6D , "Hazard Communication"
Exposure to hazardous chemicals	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Confined space	Section 6I , "Confined Space Entry"
Electrical	Section 4B , "Electrical Safety Practices"

Explosives	Chapter 9 , "Explosives Safety"
Radiation	Chapter 8 , "Occupational Radiation Protection"
Medical services	Chapter 16 , "Health, Benefits, and Employee Services"

REFERENCES

Requirements Source Documents

[29 CFR 1910.151](#), Medical Services and First Aid.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*

Implementing Documents

SNL, [PG470246](#), *10 CFR 851 Worker Safety and Health Program Plan (WSHPP).*

Related Documents

[29 CFR 1926](#), *Safety and Health Regulations for Construction:*

Subsection 20, "General Safety and Health Provisions."

Subsection 50, "Medical Services and First Aid."

Subsection 64, "Process Safety Management of Highly Hazardous Chemicals."

Subsection 200, "Accident Prevention Signs and Tags."





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ES&H Manual

SECTION 4B – ELECTRICAL SAFETY PRACTICES

Subject Matter Expert: [Mark McNellis](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue K

Revision Date: [October 19, 2006](#); Replaces Document Dated: June 15, 2006

Review Date: June 13, 2006

Administrative Change: [July 2, 2007](#)

*Indicates a substantive change

- [Applicability](#)
 - [*Electrical Safety Requirements](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce whose activities may result in a potential [electrical hazard](#) or exposure.

*ELECTRICAL SAFETY REQUIREMENTS

Requirements

Members of the Workforce shall follow the Electrical Safety Requirements detailed in CPR400.1.1.28/[MN471004](#), *Electrical Safety Manual*, at all times.



RELATED HAZARDS AND ACTIVITIES

Other hazards that may present electrical safety concerns include the following:

Hazards/Activities	Reference
Portable power tools	Section 4N , "Industrial Machine and Portable Power Tool Safety."
Receptacles near emergency showers and eyewashes	Section 6K , "Hazardous Waste Operations And Emergency Response (HAZWOPER)."
Coring and saw cutting activities	Section 4H , "Excavations, Trenches, and Floor or Wall Penetrations."
Explosives	Chapter 9 , "Explosives Safety."
Emergency Information	Chapter 16 , "Health, Benefits, and Employee Services."
Technical Work Documents	Chapter 21 , "Technical Work Documents (TWDs)."
Signage Information	Section 4M , "Signs (Including SWHAS) and Tags."
Training Information	Chapter 11 , "ES&H Training."
Control of hazardous energy (Lockout Tag out)	Section 4C , "Lockout/Tagout (LOTO)."
GEM carts in wet conditions	Section 4S , "Use of Powered Carts."

REFERENCES



Requirements Source Documents

29 CFR 1910, Occupational Safety and Health Standards, [Subpart S](#), "Electrical."

29 CFR1926, Safety and Health Regulations for Construction, [Subpart K](#), "Electrical."

ANSI C2-1997, *National Electrical Safety Code*.

ANSI/NFPA 70, *National Electrical Code (NEC)*, 2005.

ANSI/NFPA 70E, *Electrical Safety Requirements for Employee Work Places*, 2004.

[DOE 5480.4, Chg 4](#), Environmental Protection, Safety, and Health Protection Standards.

Implementing Documents

SNL, CPR400.1.1.28/[MN471004](#), *Electrical Safety Manual*.

SNL, [PG470246](#), *10 CFR 851 Worker Safety and Health Program Plan (WSHPP)*.

Related Documents

Schmidt, Elizabeth B., *Bolts from the Blue*. Harvard Health Letter, Boston, MA., Volume 17, Number 7.



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ES&H Manual

SECTION 4D – PRESSURE SAFETY OPERATIONS

Subject Matter Expert: [Roger Shrouf](#); CA Counterpart: [Herman Armijo](#)


MN471001, Issue F

Revision Date: April 13, 1999, Replaces Document Dated: September 18, 1997

Review Date: September 16, 2004

Administrative Changes: April 2, 2004, September 17, 2004, and [July 2, 2007](#)


* Indicates a substantive change

- 
- [Applicability](#)
 - [Pressure System Operations](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This chapter applies to **Members of the Workforce who perform** activities that involve the design, installation, operation, maintenance, or any other work on [pressure systems](#), including activities performed by [pressure advisors](#), [pressure installers](#), and [pressure operators](#).

PRESSURE SYSTEM OPERATIONS

Requirements

Members of the Workforce shall follow:

- The pressure safety requirements detailed in [CPR400.1.1.27/ MN471000](#), *Pressure Safety Manual*, for all pressure system applications.
- The cryogenic safety requirements detailed in [CPR400.1.1.36/GN470100](#), *Safe Handling of Cryogenic Fluids*.

Note: Consult the [pressure safety](#) contact for assistance.

REFERENCES

Requirements Source Documents

[DOE O 440.1](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [CPR400.1.1.27](#), MN471000, *Pressure Safety Manual*.

SNL, [CPR400.1.1.36](#), GN470100, *Safe Handling of Cryogenic Fluids*.

SNL, [PG470246](#), *10 CFR 851 Worker Safety and Health Program Plan (WSHPP)*.

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Corporate Process Requirement No: CPR400.1.1
Sponsor: Dori Ellis, 4000, Acting

Revision Date: June 26,
2007

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

ES&H Manual

***CHAPTER 16 – HEALTH, BENEFITS, AND EMPLOYEE SERVICES**

Subject Matter Expert: [Kay Sanderville](#); CA Counterpart: [Robert Petro](#)

MN471001, Issue M

Revision Date: [June 26, 2007](#); Replaces Document Dated: February 28, 2007

Review Date: March 20, 2006

* Indicates a substantive change

- [Applicability](#)
- [Training](#)
- [Medical Emergencies](#)
- [Non-emergency Injuries and Illness](#)
- [Reporting Injuries and Illness](#)
- [Bloodborne Pathogens](#)
- [*Return to Work](#)
- [Fitness for Duty](#)
- [Medical Monitoring/Surveillance](#)
- [First Aid Kits](#)
- [Medical Examinations/Evaluations](#)
- [Reproductive Hazards/Expectant Parent Program](#)

- [Substance Abuse Monitoring](#)
- [Behavioral Health Program \(formerly EAP\)](#)
- [Preventive Health \(formerly ¡SALUD!\)](#)
- [Foreign Travel Immunizations](#)
- [Access to Medical Records](#)
- [Protection of Human Research Subjects](#)
- [Related Hazards and Activities](#)
- [References](#)
- Forms
 - SF 2001-IMN, Interim Report to Laboratory Director: Internal Management-Notification Process for Employee Injuries ([Word file](#) / [Acrobat file](#))
 - SF 2050-P, Report of Occupational Injury/Illness ([Word file](#)/[Acrobat file](#))
 - SF 4040-FFD, Referral for Medical Evaluation ([Word file](#)/[Acrobat file](#))
 - SF 4040-NIT, Notice of International Business Travel ([Word file](#)/[Acrobat file](#))

Note: For information on business hours and services provided by SNL/NM Health Services, see the [Health, Benefits, and Employee Services Center website](#). For SNL/CA, see [CA Site Health Services](#).

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

At sites other than SNL/NM and SNL/CA, health care is provided by outside entities or through visits to an SNL health services facility.

Be aware of the applicability of the topics in this document:

- Most of the topics in this chapter apply to all personnel who are defined as Members of the Workforce.

- Portions of this document apply only to Sandia employees.

- Contractors contact their employers for services described as applicable only to Sandia employees.

TRAINING

Requirements

Role or Work Activity	NM, TTR, & KTF		SNL/CA	
	Required	Recommended	Required	Recommended
Work performed at non-Sandia-controlled premises or remote locations that do not have a medical facility or personnel trained in first aid and CPR in near proximity to the worksite ¹	MED102 MED104	N/A	MED104 MED108	N/A
Site-specific emergency response by non-medical personnel	MED105	N/A	MED105	N/A
Work involving cyanide	MED105C	N/A	MED105C	N/A
Work involving hydrofluoric acid	MED105HF	N/A	MED105HF	N/A
Own a first aid kit	MED101	N/A	MED108	N/A
ES&H coordinators	N/A	MED101	N/A	N/A

Members of the Workforce whose job duties involve the potential for occupational exposure to bloodborne pathogens (e.g., HazMat team members, security)	MED113	N/A	MED113	N/A
Security Police Officers and Members of the Workforce who work in high voltage/high risk jobs, or who are designated to be in charge of an AED.	AED Training	N/A	MED105CA	N/A

¹ Required for at least one individual per worksite.

Note: Completing [MED102](#) fulfills the [MED101](#) requirement, but completing [MED101](#) does not fulfill the [MED102](#) requirement.

Guidance

Members of the Workforce may call the [Special Training/First Aid](#) contact for more information about:

- CPR and first aid training.
- Special courses for unique job situations (e.g., security, cyanide, hydrofluoric acid, electrical workers).
- Special needs involving oxygen, medication, or extensive medical supplies (e.g., deep water diving, security).

MEDICAL

EMERGENCIES

Requirements

Members of the Workforce at remote locations shall follow the Emergency Preparedness Plan for their location.

For medical emergencies, Members of the Workforce shall:

- Call the [24-hour emergency Health Services phone number](#) for their site for [serious](#) illness, injury, or accidents.
- Follow the instructions of emergency personnel who respond to the call. Consider **every** electrical shock to be an emergency and every victim of a shock on Sandia-controlled premises shall be evaluated by Sandia Health Services or off site, local emergency room.

Site	24-Hour Emergency SNL Phone Numbers
SNL/NM	911 (Cellular: 844-0911)
SNL/CA	911 (Cellular: 294-2222)
TTR	911 (Security: 702-295-8282)
KTF	9-335-4333
Pantex	3333 or 5000 (Emergency Operations Center: 477-5000)
WIPP	234-8111
Carlsbad	911
Other	911

Guidance

Members of the Workforce should assist ill or injured persons and be prepared to provide the following information to emergency response personnel:

Information Needed in a Medical Emergency

- Type of emergency (For example: fall, laceration, illness, [electrical shock](#))
- Location of the emergency (tech area, building, and room)
- Name, age, and sex of person needing assistance
- Apparent medical condition (For example: bleeding, broken limb, breathing difficulties, unconsciousness)

For more information about emergency medical services or first aid, Members of the Workforce should call the [Medical Clinic](#) contact.

NON-EMERGENCY INJURIES AND ILLNESS

Guidance

Members of the Workforce should seek medical assistance for a non-emergency [occupational injury/illness](#) as indicated below:

During business hours...

Personnel	Action
Sandia employees	Visit SNL Health Services facility. CA/ SNL Health Services
Contractors	Visit a contractor health care provider.

After hours, offsite, or on travel

All personnel


Visit a local clinic or emergency room.

REPORTING INJURIES AND ILLNESS

Requirements

Members of the Workforce shall:

- Verbally report all [occupational injuries/illnesses](#) to their manager as soon as possible.
- Provide information regarding the illness or injury as indicated below:

Personnel	Action
 Sandia employees	Report to Health Services during operational hours and provide information to complete form SF 2050-P, <i>Report of Occupational Occurrences (Injury/Illness)</i> (Word file / Acrobat file). The 2050-P will be forwarded to the employee's manager via Workflow. or Provide information to the manager to complete form 2050-P.
Contractors	Provide information to their manager or their Sandia Delegated Representative (SDR) to complete form SF 2050-P, <i>Report of Occupational Occurrences (Injury/Illness)</i> (Word file / Acrobat file), and consult their contractor health care provider. Either the employee, Sandia representative, or SNL contracting officer will notify the company.



Managers


Forward completed SF 2050-P, *Report of Occupational Occurrences (Injury/Illness)* ([Word file](#)/[Acrobat file](#)) to:

For Sandia Employees - To Health Services

For Contractors - To ES&H Performance Assurance & Safety Programs

Interim Management Notification

Senior Managers will receive an email notification indicating that:

- 
- A [recordable injury/illness](#) has occurred within their organization.
 - They are required to complete the Internal Management Notification form.
 - Senior Managers will submit the Internal Management Notification form via the following URL, which will be provided in the email message. (https://hrprod.sandia.gov/cfdocs/prod/hris/med/mis/imns/template/imns_report.cfm). A copy of this form is also on the web ([Word file](#)/[Acrobat file](#)).
 - Once the Internal Management Notification form is submitted, a copy is transmitted to the Laboratory Director, Director of ES&H, and the appropriate line management.
 - Please contact [Heidi Herrera](#) for more information.



Guidance

For SNL employees, failure to report an illness or injury within 15 days (30 days at SNL/CA) may result in delay or denial of Workers' Compensation benefits for lost time and medical expenses.

Managers of injured personnel may keep a copy of SF 2050-P, Report of Occupational Occurrences (Injury/Illness) for their records.

Members of the Workforce at the following sites should contact the phone number listed for information on reporting injury and illness according to individual state laws and company procedures at each site:

Site	Contact	Phone
KTF	Range Manager	(808) 335-5611
TTR	Medical Department Paramedics (MDP)	(702) 295-8345
NTS	Mercury Medical Paramedics	(702) 295-6400
Pantex	Occupational Medicine Department	(806) 477-3034
WIPP	Occupational Medicine Head Nurse	(505) 234-8997

BLOODBORNE PATHOGENS

Requirements

Members of the Workforce whose job duties include performing tasks that involve an inherent potential for [parenteral](#) mucous membrane or non-intact skin contact with human blood or other potentially infectious materials shall follow the procedures described in [GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan* for the following:

- Minimizing [occupational exposure](#) to bloodborne pathogens.
- Establishing procedures for minimizing or eliminating personnel exposure.
- What to do in case of exposure.
- Communicating hazards.
- Engineering and work practice controls.
- Personal protective equipment (PPE).
- Generating [infectious waste](#).
- Storing and disposing of [infectious waste](#).
- Handling Contaminated laundry.

- Housekeeping.
- Documenting organization-specific procedures.

Guidance

Members of the Workforce may call the Emergency phone number at **911** (in NM or CA) or the Non-emergency phone number (**311** in NM, 294-3724 in CA) for additional information on cleaning spills and disposing of human blood or body fluids.

*RETURN TO WORK

*Requirements

Before returning to their worksite and assuming regular duties, **Sandia employees** shall receive approval from SNL [Health Services](#) (or the site healthcare facility for sites other than NM and CA) if they meet one or more of the following criteria:

- Were hospitalized.
- Underwent a surgical procedure.
- Were absent because of work-related illness or injury.
- Were absent due to heart or psychiatric conditions.
- Wear a dosimeter and have undergone a nuclear medicine procedure.
- Were evaluated by an outside health facility for a potential Sandia exposure to a hazardous substance or electrical shock.
- Were absent more that 40 hours in one month.
- Were absent as a result of any injury or treatment that might effect their job performance.

- Were requested by your manager to do so.
- Were requested by the Health, Benefits, and Employee Services Center to do so.
- Were absent 5 consecutive workdays or 7 consecutive calendar days.
- Need work restrictions and accommodations.
- Were absent for any illness/injury and participate in the Commercial Drivers License (CDL) and/or Crane and Hoist (C&H) medical certification Programs.

Sandia Employee Telephonic RTW Process

Members of the Workforce may call the Telephonic Return to Work ([TRTW](#)) [contact](#) to determine whether they can be approved to return-to-work over the phone or need to visit Health Services for approval.

Note: At SNL/NM, employees call 844-4584 and press option 1. Health Services will return the call within 2 hours to evaluate the TRTW.

Note: Sandia employees do not need a PCD on file to be eligible for TRTW.

*Physician's Certificate of Disability (PCD)

For an absence due to injury or illness that lasted 5 consecutive workdays or more or 7 consecutive calendar days, Sandia employees shall:


- Submit a PCD within two weeks of the beginning of the absence to the Health Services, [Absence Management Team](#).
- Have their personal physician complete SF 4560-G, Physician's Certificate of Disability (PCD) ([Word file](#)/[Acrobat file](#)).

Note: See the Sickness Absence Plan for more information.

Contractor Personnel RTW Process

Only contractor personnel who are absent as the result of an illness or injury for 5 consecutive workdays or 7 consecutive calendar days **and** meet one or more of the

following criteria shall visit SNL Health Services (or the site medical facility) before returning to work:

- 
- Wear a dosimeter and have undergone nuclear medicine procedures (e.g., thyroid scans or treatment, thallium treadmill, or bone, lung, spleen, or liver, or biliary scan).
 - Participate in any of the following medical certification programs:
 - Human Reliability Program (HRP)

Contractor Personnel who participate in the following medical certification programs shall return to work through Health Services for any illness/injury absence:

- Commercial Drivers License (CDL) Program
- Crane and Hoist (C&H) Program.



FITNESS FOR DUTY

Requirements

Managers shall:

- Observe and monitor their personnel to ensure that they are able to perform their assigned job duties in a safe and reliable manner. (See [CPR300.5.1](#), *Fitness for Duty Program*, for more information.)
- Use the Referral for Medical Evaluation form (SF 4040-FFD) to request a fitness for duty evaluation.
- Provide appropriate temporary assignments, if warranted and available, to employees who are in the process of a [fitness for duty](#) evaluation.



Members of the Workforce shall:

- Meet specific fitness for duty medical approval requirements before performing

their assigned duties.

Comply with the *Fitness for Duty Program* ([CPR300.5.1](#)).

Undergo a comprehensive medical evaluation and examination, which may include psychological assessment and drug screening, before assignment and as required thereafter for all fitness for duty certification programs.

- Seek assistance from SNL [Health Services](#) for suspected or newly diagnosed medical conditions that may affect their fitness for duty.



Guidance

Managers should:

- Participate in training programs designed to provide skills in recognizing impaired personnel.
- Consult with professional staff in SNL Health Services regarding intervention, referral, and follow-up of Members of the Workforce with known or suspected physical, mental, or [chemical dependency](#) problems. (See [CPR300.5.3](#), *Workplace Substance Abuse Prevention and Testing* for more information.)

Note: The Referral for Medical Evaluation form (SF 4040-FFD) is available from the [corporate forms page](#).




MEDICAL MONITORING/SURVEILLANCE


Requirements

Managers shall provide Members of the Workforce the opportunity to receive [medical consultation](#) and/or participate in a SNL [medical monitoring/surveillance](#) program when:


- They are injured, become ill, or develop signs and symptoms due to possible overexposure to hazardous chemicals or substances.

- 
- An event (spill, leak, explosion, or other occurrence) in the work area results in the likelihood of a hazardous exposure.
 - Exposure monitoring reveals exposure levels that routinely exceed the [action level](#) (or, in the absence of an action level, the [Permissible Exposure Limit \[PEL\]](#)) for regulated substances and beryllium requiring medical monitoring/surveillance.

Managers of Members of the Workforce who conduct hazardous waste cleanup operations or perform hazardous waste operations at treatment, storage, and disposal (TSD) facilities shall provide the opportunity for participation in an SNL medical monitoring/surveillance program when those personnel:

- 
- Are or may be exposed to hazardous substances or health hazards at or above the PEL or [Threshold Limit Value \(TLV\)](#), without regard to the use of respirators, for 30 days per year.
 - Wear a respirator for 30 days or more a year to comply with an exposure limit (e.g., PEL, TLV).
 - Are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

For Members of the Workforce in a medical monitoring/surveillance program, medical examinations and consultations shall be made available to them at the following times:

- 
- Prior to assignment.
 - As required by the specific program.
 - At termination of employment or reassignment to an area where medical surveillance would not be required (if it has been longer than 6 months since the last medical exam and the medical monitoring/surveillance program requires a termination exam).
 - As soon as possible upon notification that an individual has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that an individual has been injured or exposed above the permissible exposure limits or TLV in an emergency situation.

Members of the Workforce shall:

- Comply with the requirements of [CPR300.5.5](#), *Medical Monitoring/Surveillance*, as well as any specific medical monitoring/surveillance program in which they participate.
- Inform their manager and SNL Health Services if they become injured, ill, or develop signs and symptoms due to possible overexposure to hazardous chemicals or substances and of any events (spill, leak, explosion, or other occurrence) in the work area resulting in the likelihood of a hazardous exposure.

Guidance

Managers should:

- Consult with the [Occupational Medicine Programs Team](#) contact to determine whether personnel working with [hazardous substances](#) or in a hazardous environment should participate in a medical monitoring/surveillance program.
- Inform the [Occupational Medicine Program Team](#) contact in writing of specific Members of the Workforce who should participate in or be removed from a medical surveillance program (as recommended by their [Division ES&H Team](#)).

Members of the Workforce should consult their Industrial Hygienist for additional guidance on whom, based on exposure, should participate in or be removed from a SNL medical surveillance program.

- Inclusion in the Beryllium Medical Surveillance Program is voluntary when employees are exposed or potentially exposed to airborne Beryllium regardless of the exposure level.

FIRST AID KITS

Requirements

Managers shall make a first aid kit available to Members of the Workforce located at non-

[Sandia-controlled premises](#) or remote locations that do not have an infirmary, clinic or hospital in [near proximity](#) to the worksite.

Guidance

Any manager who feels he or she needs one, may order a first aid kit.

Managers should designate an individual to check first aid kits in their organization monthly and to replace used supplies promptly as needed. These can be ordered through JIT.



Warning: Do not use ammonia inhalants from commercially available kits to arouse unconscious individuals. Remove these inhalants from the kit and call the [CPR/First Aid Coordinator](#) contact for disposal instructions.

- Standard first aid kits and replacement supplies are available through JIT. The Johnson & Johnson "Standard" Kit (available in different sizes) is suitable for most purposes.
- Managers who have already purchased first aid kits from an outside commercial source may send a list of contents to the [CPR/First Aid Coordinator](#) for review. Many commercially available kits have items that should be removed because of the potential for adverse side effects.
- First aid kits should contain only bandaging material used for minor injuries or until emergency medical professionals arrive. These kits should not be used for storing or dispensing medication, including non-prescription remedies.
- Members of the Workforce may keep personal medications in their work area; however, all Members of the Workforce should visit the health services facility rather than ask coworkers for medication.
- To receive more information on first aid kits by return e-mail, consult the [CPR/First Aid Coordinator](#) contact.

MEDICAL EXAMINATIONS/EVALUATIONS

Requirements

All Sandia employees shall:

Preplacement

- Undergo a physical examination/evaluation before beginning work for Sandia.
Note: At SNL/CA, a new hire physical is offered to employees during initial orientation, but the examination is voluntary.
- Complete a Job Placement Assessment (JPA) if the essential job functions require lifting more than 35 pounds. The manager shall consult with the [Job Accommodation Specialist \(JAS\)](#) contact to assure the JPA for their workplace is the most current prior to interviews.

Termination

The employees in the following medical surveillance programs are required to have an exit exam prior to terminating from Sandia National Laboratories:

- Arsenic
- Asbestos
- Hazardous Waste
- Lead
- Methylenedianiline (MDA)
- Reactor Operators (ROs)

To schedule your exam please contact HBE at 844-4237.

Guidance

Voluntary

A voluntary Health Care Assessment (HCA) is available every three years to Sandia employees from Health Services personnel at SNL/NM and SNL/CA. For more information consult the [Preventive Health contact](#) or the http://www-irn.sandia.gov/hr/health_wellness.htm

Voluntary Termination Exam

Sandia employees may accept a voluntary physical examination and evaluation prior to termination from Sandia.

HRA SNL/CA Employees

SNL/CA employees are invited to have a Health Risk Assessment (HRA) annually. Individuals may be provided follow-up HRAs based on health risks and strategies in place to lower risks. Life Design Center (LDC) members are required to have periodic HRAs (usually every 2 years) to ensure continued safe use of the facility.

REPRODUCTIVE HAZARDS/EXPECTANT PARENT PROGRAM

Guidance

Members of the Workforce at all sites should contact the [Expectant Parent Program Owner](#) or their assigned [Medical Case Manager](#) for information regarding possible reproductive hazards in the workplace (for both men and women). This contact should be made during pregnancy planning or as early as possible once pregnancy is confirmed. Members of the Workforce who are concerned about reproductive hazards should consult the [Expectant Parent Program Owner](#) or their [Medical Case Manager](#) for information about:

- Scheduling an evaluation of potential ionizing radiation exposures (see CPR400.1.1.32, MN471016, *Radiation Protection Procedures Manual*, [Chapter 14](#), "Declared Pregnant Workers" for more information).
- Arranging for an evaluation of other potential hazards (e.g., chemical, non-ionizing

radiation, lasers, noise, and ergonomic stressors).

Members of the Workforce who are pregnant, are contemplating pregnancy, or are planning to adopt or foster parent a child should consult the [Medical Case Manager](#) for:

- Information about available benefit options.
- A copy of GD-MED001, "Guide to Services and Benefits for Expectant/Adoptive/Foster Parents," which provides additional information.

SUBSTANCE ABUSE MONITORING

Requirements

All candidates for employment at Sandia shall be tested for [substance abuse](#) prior to employment with Sandia, and personnel in certain positions involving safety and security shall be subject to [random substance abuse testing](#).

Managers shall:

- Consult with the Behavioral Health contact or professional staff in SNL Health Services if [reasonable suspicion](#) exists that an employee is under the influence of [alcohol](#) or [illegal drugs](#), or abusing legal drugs. (Following consultation, the employee may be tested and, if appropriate, directed to seek help so that a drug or alcohol problem will not affect the employee's health or work environment.)
- Notify the [Sandia Contracting Representative \(SCR\)](#), the [Sandia Delegated Representative \(SDR\)](#), and Health, Benefits, and Employee Services if reasonable suspicion exists that a contractor is under the influence of alcohol or illegal drugs, or abusing legal drugs.

Members of the Workforce in the Commercial Drivers License (CDL) Program, Crane and Hoist (C&H) Program, or Human Reliability Program (HRP) shall report to the SNL Health Services facility for substance abuse testing at the following times:

- After any accident or occurrence in which they were involved.

- When notified by SNL [Health Services](#) to report for random testing.

Guidance

Members of the Workforce should see [CPR300.5.3](#), *Workplace Substance Abuse Prevention and Testing* for more information on substance abuse monitoring.

BEHAVIORAL HEALTH PROGRAM (formerly EAP)

Guidance

Employees may request counseling from the Behavioral Health Program for personal, emotional, job-related, and [substance abuse](#) problems. The Behavioral Health program can provide counseling for employees and their families, and all visits are confidential within the limits of federal and state laws and regulations. There is no cost to employee or family members for up to eight visits per year unless referral is made to an outside provider or treatment facility.

Employees may call the Behavioral Health Program contact for more information.

PREVENTIVE HEALTH (formerly ¡SALUD!)

Guidance


SNL employees may participate in SNL's Preventive Health Program, which offers the following services: preventive health screenings, assessments, counseling, seminars, and classes designed to reduce lifestyle risk factors and provide opportunities for employees to achieve and maintain optimal health.

Employees may call 294-3501 for more information, or visit the [NM Preventive Health website](#) or the [CA Preventive Health website](#).


FOREIGN TRAVEL IMMUNIZATIONS

Guidance

Members of the Workforce preparing for foreign travel on company business should:

- 
- Complete the Notice of International Business Travel form SF 4040-NIT ([Word file/Acrobat file](#)).
 - Forward this form to the International Travel Clinic (ITC) as soon as a decision to travel has been made to allow for sufficient time for appropriate spacing of certain vaccines prior to departure.
 - Receive required immunizations prior to travel.

Members of the Workforce should consult the [ITC](#) contact for information regarding:

- 
- Recommended and/or required destination-specific immunizations.
 - Appropriate spacing of vaccines.
 - Other related preventive services.
 - HIV testing for visa application (if necessary).
 - International SOS – for worldwide emergency services information and member card.

Note: Receipt of form SF 4040-NIT ([Word file/Acrobat file](#)) will generate a memo from an ITC nurse for the traveler to schedule an appointment with the clinic if indicated. The traveler should have immunization records and detailed trip itinerary available when consulting with the nurse.

For more information, Members of the Workforce should call the International Travel Clinic at 844-8949, or visit their [website](#).



ACCESS TO MEDICAL RECORDS

Requirements

Sandia employees (or contractor employees who have medical records concerning treatment at a Sandia facility) or their designated representative shall complete, sign, and submit an Authorization for Release of Medical Information form.

Health Services staff shall ensure that Members of the Workforce receive a copy of medical records within 15 working days.

Guidance

If records cannot be provided within 15 days, employees should be notified of reason for delay and anticipated date when records will be available.

PROTECTION OF HUMAN RESEARCH SUBJECTS

Requirements

Members of the Workforce shall obtain written approval for research from the [SNL Human Studies Board \(HSB\)](#) before involving any human volunteer, collecting any human specimens, or gathering any data on humans.

See the [HSB website](#) for information on mandatory training.

Guidance

The HSB reviews proposed research to protect the safety and rights of human research subjects. Members of the Workforce should see:

- The [HSB home page](#) for requirements and guidance on obtaining HSB approval.

- [CPR300.5.2](#), *Protection of Human Research Subjects* for more information on protecting human subjects.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to an injury or illness include:

Hazard/Activity	Reference
Chemical hazards	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Emergencies	Chapter 15 , "Emergency Preparedness and Management"
Ergonomics	Chapter 6V , "Ergonomics"
Hazardous waste operations and emergency response	Section 6K , "Hazardous Waste Operations and Emergency Response (HAZWOPER)"
Infectious Waste	GN470086 , "SNL Bloodborne Pathogens Exposure Control Plan"
Noise exposure and hearing exams	Section 6H , "Noise Exposure and Hearing Conservation"
Reporting Accidents	Section 18F , "Reporting Vehicle Accidents and Property Damage"
Respirator use	Section 6C , "Respiratory Protection"
Technical work documents (TWDs)	Chapter 21 , "Technical Work Documents (TWDs)"
Working with lasers	Section 6G , "Lasers and Intense Light"
Workplace violence	CPR300.5.4 , <i>Workplace Violence Prevention Program</i>

REFERENCES

Requirements Source Documents

[10 CFR 707](#), *Workplace Substance Abuse Programs at DOE Sites.*

[10 CFR 712](#), *Human Reliability Program.*

[29 CFR 1904](#), *Recording and Reporting Occupational Injuries and Illnesses.*

[29 CFR 1910](#), *Occupational Safety and Health Standards.*

[29 CFR 1910.1030](#), *Bloodborne Pathogens.*

[49 CFR](#), *Federal Motor Carrier Safety Regulations.*

[DOE O 231.1A](#), *Environment, Safety and Health Reporting.*

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*

[DOE O 443.1](#), *Protection of Human Subjects.*

[DOE 5480.4](#), *The Environmental Protection, Safety, and Health Standards.*

American with Disabilities Act of 1990, Titles I and V. Compensation Reform Act of 1989 (California).

New Mexico State Workers' Compensation Act, 1990.

Workers' Compensation Laws of California, 1997.

Implementing Documents

SNL, [CPR300.5.1](#), *Fitness for Duty Program.*

SNL, [CPR300.5.2](#), *Protection of Human Research Subjects.*

SNL, [CPR300.5.3](#), *Workplace Substance Abuse Prevention and Testing.*

SNL, [CPR300.5.5](#), *Medical Monitoring/Surveillance.*

SNL, [CPR300.5.7](#), *Medical Restrictions.*

SNL, [CPR300.5.8](#), *Workers' Compensation.*

SNL, [GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan.*

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ES&H Manual

SECTION 10B – NATIONAL ENVIRONMENTAL POLICY ACT (NEPA), CULTURAL RESOURCES, AND HISTORIC PROPERTIES

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*Indicates a substantive change

- [*Applicability](#)
 - [Training and Qualifications](#)
 - [*DOE NEPA Compliance](#)
 - [*Understanding and Applying Facility Environmental Operations Limits Included in SNL Site-Wide Environmental Documents](#)
 - [*U.S. Air Force NEPA Compliance at SNL/NM](#)
 - [*Cultural Resources and Historic Properties for All SNL Sites](#)
 - [*References](#)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).

- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

The National Environmental Policy Act (NEPA) **Compliance Review requirements** apply to federally funded proposed [actions](#), including privately funded actions performed on federal facilities, such as Cooperative Research and Development Agreements (CRADAs). **In effect, the requirements apply to all Sandia National Laboratories (SNL) activities performed on private and government properties. This applicability extends to SNL activities proposed to be performed in international settings, where the role of SNL researchers, and potential environmental issues associated with SNL activities, must be identified through the NEPA Compliance Review process described in this section.**

TRAINING AND QUALIFICATIONS

Training

Role or Work Activity	Required Training	Recommended Training
Members of the Workforce responsible for NEPA: Owners of the proposed action who are responsible for initiating a NEPA compliance review.	N/A	ENV120 ISMS100
Qualified NEPA reviewers (QNRs): Trained ES&H coordinators, or other trained NEPA reviewers, who support organization NEPA compliance activities at SNL/NM. Note: QNRs are trained and located only at SNL/NM.	ENV120 ENV121-1 (Contact NEPA SME for training.) ISMS100	N/A



NEPA Subject Matter Experts (SMEs):
 Experts in NEPA regulations and requirements who are qualified to make a citation to existing NEPA documentation or forward a proposed action to the U.S. Department of Energy/ National Nuclear Security Administration/ Sandia Site Office (DOE/NNSA/SSO) for a NEPA determination.

ENV120

ENV121-1
 (Contact NEPA SME for training.)

ISMS100

N/A

Qualifications

Requirements

In addition to the required training listed above, **Members of the Workforce** who are responsible for preparing NEPA documents shall meet the following criteria:

Role or Work Activity	Required Qualifications
<p>Members of the Workforce who are responsible for NEPA compliance (i. e., owners of the proposed action and those who are responsible for initiating a NEPA Compliance Review).</p> <p>Note: Where the proposed work involves both construction and operations, Members of the Workforce of both the construction and operations programs must share responsibility for NEPA compliance.</p>	<ul style="list-style-type: none"> • Be cognizant of the scope and technical details of the proposed action (as provided in the project description) and able to assist the NEPA specialists in identifying environmental aspects and potential impacts associated with the proposed action. • Identify and coordinate potential environmental impacts in the NEPA Compliance Review, for both phases of the project, for proposed activities involving joint construction and subsequent facility operations.

QNRs

Note: QNRs are trained and located only at SNL/NM.



- Be familiar with key NEPA reference documents, **such as** site-wide environmental impact statements.
- Be trained in the use of the **Integrated Safety Management System (ISMS) NEPA Module** and **current in other required** training.
- Be designated by the responsible SNL **NEPA SME** and respective division **ES&H Coordinator** to review and apply NEPA citations against existing NEPA reference documents.
- **Acquire DOE/NNSA/SSO NEPA Compliance Officer concurrence to review NEPA checklists under the supervision of NEPA SMEs.**

NEPA SMEs

- Have a thorough understanding of NEPA **requirements** and DOE implementing regulations.
- Be trained in the use of the **ISMS NEPA Module** and **current in other required** training.
- Be familiar with the content of key NEPA documents associated with SNL operations.



- Acquire DOE/NNSA/SSO concurrence to review and approve NEPA citations against existing NEPA reference documents.

*DOE NEPA COMPLIANCE

Requirements

NEPA Planning Process

For potential activities that may affect or change a facility's physical (e.g., ground disturbance) or operations (e.g., adding new hazardous test materials) environment, SNL managers shall be responsible for ensuring that a NEPA Compliance Review is prepared early in the project-planning and decision-making process.

NEPA Compliance Review Process

Completing a NEPA Compliance Review

Managers or Members of the Workforce who are owners of a proposed action shall:

- Use the [ISMS Software NEPA Module](#) process described below, or an approved [equivalent process](#), to complete a NEPA Compliance Review.
- Obtain approval from a [NEPA SME](#) or DOE/NNSA/SSO **before** initiating a proposed action.

Note: Failure to complete this process before initiating project activities, particularly activities involving ground disturbance, may result in the issuance of an environmental occurrence.

Follow these steps to create and complete a NEPA Compliance Review Record:

Step	Action
------	--------



1 Log onto the [ISMS Software Home Page](#) and click on:

- a. NEPA Module.
- b. Start NEPA.
- c. Create.

Note: For SNL/NM, if the project would occur outside a Technical Area, but within the boundaries of Kirtland Air Force Base, an Air Force Form 813 (AF Form 813), "Request for Environmental Impact Analysis," may be required in place of or in addition to a DOE NEPA Checklist (see [Step 4](#)). Consult a [NEPA SME](#) or [QNR](#) for assistance.



2 Complete the NEPA Compliance Review Record by doing the following:

- Provide details regarding how the activities of the proposed project could affect the human environment, for example, would the proposed action:
 - Produce air emissions?
 - Require discharges to the ground or sanitary sewer?
 - Require the use of hazardous material?
 - Generate hazardous waste?
 - Produce other potential impacts?



Note: The list of potential environmental impacts to be discussed would depend on the environmental aspects associated with the proposed action.

- Find help by doing one of the following:
 - Click on the hyperlinks on the screen.

- Access [Guidance for Using the ISMS NEPA Module](#) on the NEPA website.
- Consult a [NEPA SME](#) or [QNR](#)

3 Submit the NEPA Compliance Review Record by clicking Save and Submit under the Submit tab.

Note: After reviewing the proposed action, the NEPA SME may determine that a NEPA Checklist shall be prepared, and will return the NEPA Compliance Review Record back to Preparation so that this can be done. To prepare the NEPA Checklist, go to [Step 4](#).

4 Prepare the NEPA Checklist as follows:

- Click on the URL provided in the “(EW) Notice: NEPA Action... SNL NEPA SME requesting more info” email.
- Click on the ES&H Concerns tab.
- Complete the checklist and explain all “yes” answers in the text box.

When the NEPA Compliance Review Record is complete, submit it by clicking Save and Submit under the Submit tab.

SNL Review and Approval of NEPA Record

If the submitted NEPA Compliance Review Record is detailed enough to enable a [NEPA SME](#) or [QNR](#) to determine whether existing NEPA documentation covers the environmental aspects and impacts, then:

- The review can be completed at SNL.
- The software sends an automatic email to the project owner, the organization’s [ES&H Coordinator](#), and other interested parties, stating that the review is complete.

If insufficient detail is provided in the NEPA Compliance Review Record, a NEPA SME

or QNR can request more environmental aspect and impact information to enable completion of the review (see [Step 3](#) above).

DOE Review and Approval

If no existing NEPA documentation covering the SNL proposed action is available, a NEPA Checklist must be prepared and submitted to the SSO NEPA Compliance Officer at DOE/NNSA/SSO (see [Step 4](#) above).

The SSO NEPA Compliance Officer determines whether a categorical exclusion (CX) can be cited, or whether more extensive NEPA documentation must be prepared (such as an environmental assessment [EA]). Once the decision is made to prepare a checklist, the NEPA Checklist screen (ES&H Concerns tab) is added to the [ISMS Software NEPA Module](#), either by the software or by the SME.

Once DOE/NNSA/SSO completes a determination on a checklist and enters the information into the ISMS Software NEPA Module, the software sends an automatic email to the project owner and other interested parties, announcing that the proposed action has been approved.

Use of the NEPA Compliance Review Identification Number (NEPA ID Number)

Once the NEPA Compliance Review has been approved, cite the NEPA Compliance Review identification number (NEPA ID number) issued by [the ISMS Software NEPA Module](#) (found under the tab title in each NEPA Module screen) when:

- Preparing proposed action funding requests, if required.
- Documenting the NEPA Compliance Review (other methods of documentation may be required for an [equivalent NEPA Compliance Review process](#)).

Note: Compliance with NEPA requirements does not ensure that all ES&H requirements have been identified or addressed. Consult the appropriate [Division or Center ES&H Coordinator](#), [Environmental Protection Representative](#), or [Division ES&H Team member](#) for assistance regarding other regulatory requirements that may affect the project.

Equivalent NEPA Compliance Review Process

Members of the Workforce who do not use the [ISMS Software NEPA Module](#) to perform and document NEPA Compliance Reviews shall take the responsibility to use or establish an equivalent process (approved by a [NEPA SME](#) in consultation with DOE) that documents that the following has occurred:

- Proposed actions have been reviewed for potential environmental impacts.
- [QNRs](#) or [NEPA SMEs](#) (and, preferably, the appropriate [ES&H Coordinator](#)) have been consulted to determine whether an existing NEPA analysis applies or a DOE NEPA Compliance Review has been completed.
- NEPA Compliance Reviews and records have been established for DOE review.

NEPA Recordkeeping

Use of the [ISMS Software NEPA Module](#) establishes a NEPA compliance record that follows SNL/NM corporate [recordkeeping guidance](#) and meets DOE NEPA records requirements. Records documented in the ISMS Software NEPA Module are available for DOE review, as requested, and are archived according to SNL requirements.

Members of the Workforce who are process owners for an [equivalent NEPA Compliance Review process](#) shall submit copies of all NEPA-related records to the [ES&H and Security Record Center](#).

Note: The [ES&H and Security Record Center team](#) supports the NEPA Program by establishing and maintaining a records-management process that complies with DOE and regulatory requirements, and also provides a central repository for all ES&H records and interpretations of regulatory requirements related to records management.

*Understanding and Applying Facility Environmental Operations Limits Included in SNL Site-Wide Environmental Documents

Requirements

Facility Environmental Operations Limits

Through the environmental impact analysis included in SNL site-wide environmental documents, the DOE establishes environmental operations limits under which SNL facilities shall operate. These limits are established from data provided by facility operators based on existing plans or on best estimates of activities at the facility (which were usually projected for five and ten years). The DOE has published these limits in site-wide NEPA documents for SNL/NM, SNL/CA, and Tonopah Test Range (TTR). For further information, see [Guidance](#) under this topic).

A Member of the Workforce (who is usually a facility's Program Manager) shall:

- Be aware of the environmental operations limits for the facility where new work is proposed to be done.
- Determine whether proposed new work activities would exceed any bounding environmental limits that are in place.
- Perform a NEPA Compliance Review in the [ISMS Software NEPA Module](#), when a proposed action is expected to exceed a facility's environmental operations limits.


The NEPA Compliance Review may require preparation of a NEPA Checklist if the proposed action is not included in existing SNL NEPA documents. The NEPA Checklist would then be transmitted by a NEPA SME to DOE/NNSA/SSO, which would determine whether additional environmental impact analysis and documentation are required to cover changes in the facility's operations.

Note: Exceeding a facility's bounding environmental operations limits without initiating a NEPA Compliance Review can result in an environmental occurrence. Consult a [NEPA SME](#) in the [Environmental Management Department](#) for more information on facility environmental operations limits and how they are interpreted in the context of facility operations.

Guidance

Documented Environmental Operations Limits


In preparing SNL/NM's Site-Wide Environmental Impact Statement (SWEIS) (DOE/EIS-0281) and SNL/CA's Site-Wide Environmental Assessment (SWEA) (DOE/EA-1422),



both SNL sites provided operational data and information on operations of their major facilities. This information included details on hazardous material inventories and usage, air emissions, liquid discharges, level of operations, etc.

On the basis of a site's specific and cumulative facility-operations information, DOE performed a comprehensive site-wide environmental impact analysis for operating the sites' various facilities within a specific set of potential environmental impacts. (Analysis of environmental factors for operating TTR was included in the Nevada Test Site's SWEIS.)

As a result of DOE's analysis, SNL/NM's SWEIS and SNL/CA's SWEA established environmental operations limits for certain key facilities. The facilities' operations numbers and data quantities were used to establish bounding environmental limits for facility operations under each site-wide impact analysis.



The basic sources for the information and data on facilities' environmental operations limits are the SNL site-wide environmental documents. In the case of SNL/NM, environmental operations limits are included in the SNL/NM SWEIS, and other relevant documents, and for SNL/CA, information is included in the SNL/CA SWEA. Information about TTR environmental limits is included in the Nevada Test Site Site-Wide Environmental Impact Statement.

Copies of the SNL/NM SWEIS are available through the SNL/NM [Technical Library](#), the [ES&H Library](#), or a [NEPA SME](#).

Members of the Workforce should consult a NEPA SME in the [Environmental Management Department](#) to discuss the bounding environmental operational limits for a specific SNL/NM facility, if necessary.



*U.S. AIR FORCE NEPA COMPLIANCE AT SNL/NM

Requirements

The process described in this section applies to activities related to Air Force land-use permits located outside SNL/NM Technical Area (TA) boundaries, but within Kirtland Air Force Base (KAFB).

Members of the Workforce, in consultation with a [NEPA SME](#), shall complete the following actions before beginning activities on U.S. Air Force (USAF) properties on KAFB:



- Consult with the [Space and Real Estate Management Department](#) to determine whether a new or modified land-use permit will be required to support proposed SNL/NM activities.
- Prepare the required USAF NEPA documentation for new land-use permits or permit modifications, if the decision is made to secure a new or modified land-use permit. (Permit renewals are initiated by the Space and Real Estate Management Department.)

Note: Federal agency property ownership within the boundaries of KAFB is complex; therefore, NEPA requirements can vary and will be addressed on a case-by-case basis. The [Space and Real Estate Management Department](#) maintains detailed real estate maps identifying DOE- and non-DOE-owned property and permit files for the use of non-DOE property.



To complete the USAF NEPA requirements, follow these steps:

Step	Action
1	<p>Determine whether the proposed action affects property on KAFB not owned by DOE (usually those lands outside the boundaries of SNL/NM TAs).</p> <ul style="list-style-type: none"> ● Consult the Space and Real Estate Management Department or a NEPA SME regarding actions described in current permits and for assistance in determining whether a proposed action could affect property not owned or administered by DOE (see "Guidance" in this topic for information that can be used to assist in this determination). ● If a proposed action affects only DOE-owned property, USAF NEPA process compliance requirements do not apply. ● If a proposed action affects property on KAFB not owned by



DOE, go to [Step 2](#).

Note: Requests for new land-use permits require approval by the KAFB Siting Board before the NEPA process can be completed (consult the SNL/NM Space and Real Estate Management Department for more information).

2 Determine whether USAF NEPA documentation is required.

- Consult a [NEPA SME](#) for assistance in determining whether a proposed action requires USAF NEPA documentation.
- If no additional USAF NEPA documentation is required, **then** the process is complete.
- If additional USAF NEPA documentation is required, go to [Step 3](#).

3 Prepare documentation.

- If AF Form 813, "Request for Environmental Impact Analysis," or an Air Force [environmental assessment \(EA\)](#), is required, a [NEPA SME](#) **leads** the **preparation of the** necessary document in cooperation with Members of the Workforce.
- **Once the documentation is prepared**, a [NEPA SME](#) submits **it** to DOE **which**, upon approval, transmits the document to the USAF for a final determination.

4 Receive USAF NEPA determination.

- If the USAF provides a final NEPA determination, compliance with USAF NEPA requirements is complete. Requirements established by the USAF in its NEPA determination shall be met for the NEPA determination to remain valid.
- If the USAF NEPA determination **requires more information**, then provide input to or prepare additional USAF-required NEPA documentation.



Guidance

Members of the Workforce at SNL/NM should:

- Assist in the preparation of USAF NEPA documentation for proposed actions that are **not** on DOE-owned land and that have **not** been analyzed in previous USAF NEPA documentation. **Additional guidance is available on the [SNL/NM National Environmental Policy Act \(NEPA\)](#) website.**
- Allow 6 to 12 weeks for review and approval of USAF NEPA documentation.
- Notify the responsible [NEPA SME](#) if the project is high priority. A NEPA SME can communicate this to the KAFB Technical Advisory Subcommittee (TAS), which may consider a prompt review of the documentation.
- **Consult** the [Space and Real Estate Management Department](#) for assistance with real estate permits or permit renewal.



Note: A proposed action located outside of SNL/NM **TAs** is probably on land **not** owned **or administered** by DOE, **including** activities on properties **located in the** Coyote Test Field (e.g., the Robotic Vehicle Range, the National Solar Thermal Test Facility, the Shock Thermodynamics Applied Research Facility, Thunder Range, the Explosive Test Facility, and the Video Technology Laboratory, or in other facilities in the Withdrawn Area, such as the Aerial Cable Facility, Lurance Canyon Burn Site, the 9990 Complex, etc.).

*CULTURAL RESOURCES AND HISTORIC PROPERTIES **FOR ALL SNL SITES**



Requirements

Members of the Workforce at all SNL locations shall use the following procedure before undertaking an [action](#):

Step	Action

1 In consultation with a [NEPA SME](#) or corporate historian, determine whether the proposed action could affect historic properties. Examples of such actions include but are not limited to the following:

- Construction of new buildings or facilities.
- Modification of internal or external portions of existing structures, including buildings and test fixtures built or acquired prior to 1989.
- Projects that require grading or excavation, particularly if the project is located outside a TA fence.
- Maintenance and cleanup activities that might result in inadvertent collection and destruction of historic artifacts.

If the proposed action will **not** affect historic properties, then compliance with historic properties regulations is **not** required. Consultation with a [NEPA SME](#) is recommended to verify this determination.

If the proposed action may affect historic properties, then go to [Step 2](#).

2 If adequate survey information for historic properties exists for the area of the proposed action, then a [NEPA SME](#) provides the survey information to and consults with appropriate DOE personnel. Go to [Step 4](#).

If adequate survey information does **not** exist for the area of the proposed action, then go to [Step 3](#).

3 Obtain surveys of the area of the proposed action, conducted by recognized experts (archeologists or architectural historians), to identify and document historic properties, and then forward the survey information to a [NEPA SME](#).

The NEPA SME provides the survey information to and consults with the appropriate DOE personnel.

Consult a NEPA SME for help with obtaining these surveys.

- | | |
|---|---|
| 4 | Obtain notification and documentation of completion of the historic properties compliance process from a NEPA SME . |
|---|---|

Members of the Workforce who, during earth-disturbing activities, find objects or artifacts that may be historic properties, shall suspend work in a safe manner and consult a [NEPA SME](#).

SNL may be required to provide input to or to prepare other NEPA documentation directed by DOE, such as an environmental assessment or an environmental impact statement. Consult with a NEPA SME for additional information on these requirements.



Guidance

Department and project managers should:

- Begin the historic properties compliance process either before or simultaneously with the DOE and USAF NEPA compliance processes.
- Be aware that historical resource documentation [requirements of a State Historic Preservation Office \(SHPO\)](#) can affect project schedules and costs; consult a [NEPA SME](#) if this becomes a requirement.
- Consult a NEPA SME to resolve questions about the compliance process for historic properties requirements.



*REFERENCES

Requirements Source Documents

[10 CFR 1021](#), *Department of Energy NEPA Implementing Procedures*.

U.S.C. § 470 et seq., *The National Historical Preservation Act*, as amended.

[36 CFR 60](#), *National Register of Historic Places*.

[36 CFR 800](#), *Protection of Historic Properties*.

[40 CFR 1500-1508](#), *Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

[64 FR 69996-70003](#), *Federal Register, Vol. 64, No. 240; Wednesday, December 15, 1999; Notices: Sandia National Laboratories, New Mexico , Site-Wide Environmental Impact Statement; Department of Energy Record of Decision*.

[DOE/EIS-0281](#), *Final Site-Wide Environmental Impact Statement for Sandia National Laboratories/New Mexico*, U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico, 1999.

SNL, [CPR400.4.2](#), *Corporate Space and Real Estate Management*.

SNL, [CPR400.4.2.20](#), *Management of Information Throughout its Life Cycle, Section 3.6*, “Records Retention and Disposition Schedule and Processes.”

U.S. Air Force, Instruction 32-7061, *The Environmental Impact Analysis Process*.

Implementing Documents

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

SNL, [PG470110](#), *The National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties Programs*.

Related Documents

16 U.S.C. § 469(a)-(c), *Archeological and Historic Preservation Act of 1974*.

16 U.S.C. § 470(a)-(t), *Archeological Resources Protection Act of 1979*.

20 U.S.C. § 5501 et. seq., *National Environmental Education Act*, as amended.

25 U.S.C. § 3001 et. seq., *Native American Graves Protection and Repatriation Act*.

42 U.S.C. § 1996, *Protection and Preservation of Traditional Religions of Native*

Americans.

42 U.S.C. § 2011 et. seq., *Atomic Energy Act of 1954 (AEA)*, as amended.

[42 U.S.C. § 4321 et seq.](#), *National Environmental Policy Act of 1969*, as amended.

42 U.S.C. § 4372, *Environmental Quality Improvement Act*, as amended.

 DOE/EA-1422, *Final Site-Wide Environmental Assessment of the Sandia National Laboratories/California Site*, January 2003.

[DOE O 450.1, chg 1](#), *Environmental Protection Program*.

[DOE O 481.1B](#), *Work for Others (non-Department of Energy Funded Work)*.

[Executive Order 11593](#), *Protection and Enhancement of the Cultural Environment*.

[Nevada Revised Statutes \(NRS\) Annotated, Title 47, Chapter 527](#), *Protection and Preservation of Timbered Lands, Trees and Flora*.

SNL, [Memorandum of Understanding Between SNL/NM Environmental Management Department and the DOE Office of Kirtland Site Operations Outlining the Qualified NEPA Reviewer Processes at SNL/NM](#).



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ES&H Manual

SECTION 4N – INDUSTRIAL MACHINE AND PORTABLE POWER TOOL SAFETY

Subject Matter Expert: [David Sepulveda](#); CA Counterpart: [Terry L. Garner](#)

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* Indicates a substantive change

- [Applicability](#)
- [*Training](#)
- [Establishing a Safe Work Environment](#)
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- [*Inspections, Maintenance, and Testing](#)
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- Attachments
 - [4N-1](#) - Chain Mortiser
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- [4N-20](#) - Bandsaw
- [4N-21](#) - Radial Arm Saw
- [4N-22](#) - Table Saw
- [4N-23](#) - Shaper
- [4N-24](#) - Sheet Metal Shear and Break

- *Forms

- SF 2001-AMP, Authorization to Use Machine or Power Tool Equipment in Bldg. __ ([Word file](#)/[Acrobat file](#))
- SF 2001-MIC, Machine Inspection Checklist ([Word file](#)/[Acrobat file](#))
- SF 2001-PPT, Portable Power Tool Test Record ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities on Sandia-controlled premises involving machinery that is classified as industrial machines, portable power tools, or [industrial robot systems](#). Such machinery is typically used in machine shops and is represented by the


types of equipment addressed in this document and the attachments to Section 4N. Consult the appropriate [Division ES&H Team](#) for further assistance.

This section does **not** apply to office machines.


*TRAINING


*Requirements

Work Activity or Role	Required	Recommended
Use of industrial machines	<ul style="list-style-type: none"> On-the-Job Training (OJT) (SNL/NM) or MCH100 (SNL/NM). <p>Note: See Chapter 11, “ES&H Training,” for information on OJT training requirements and procedures.</p> <ul style="list-style-type: none"> MCH111 or MCH112 (SNL/CA) . <p>Note: MCH111 does not include mill and lathe machine training. MCH112, however, does include these training topics.</p>	

 <p>Use of portable power tools</p>	<p>OJT (SNL/NM) or MCH100 (SNL/NM). Note: See Chapter 11, "ES&H Training," for information on OJT training requirements and procedures.</p>	
<p>Use of industrial robot systems</p>	<p>OJT (SNL/NM). Note: See Chapter 11, "ES&H Training," for information on OJT training requirements and procedures.</p>	<p>RBT100 RBT100R</p> <p>Note: Re-qualification is obtained by attending RBT100R refresher training course every 36 months.</p>

Managers shall be responsible for ensuring that:

- 
- Operators of industrial machines, portable power tools, and [industrial robot systems](#) are trained in the safe use of the machines, tools, and equipment they use.
 - OJT, **where identified**, is provided to each operator and includes the **following topics**:
 - Selection.
 - Proper use.
 - Limitations of each industrial machine, portable power tool, or industrial robot system that the operator will use.
 - Site-specific requirements.
 - A demonstration by the operator of its safe use in addition to instructions outlined in [Chapter 11](#), "ES&H Training."



Note: See [Chapter 11](#) under the topic, "Organization-Managed Training," for further information on the degree of rigor imposed on OJT requirements.

- Machine-use authorization is documented using a form such as SF 2001-AMP, Authorization to Use Machine or Power Tool Equipment in Bldg. ____ ([Word file](#)/[Acrobat file](#)).
- Formal training procedures are documented, as applicable.
- Operator training and authorization records are maintained until replaced by more current records.



Members of the Workforce shall:


- Be trained and authorized for the specific industrial machines, portable power tools, and industrial robot systems prior to operating the equipment.
- Be trained and authorized for the hazards associated and safe use of the machines, tools, and equipment prior to operating the equipment.
- Read and understand any relevant manufacturers' instruction manuals or technical work documents (TWDs) and document by signature, as appropriate, prior to operating the equipment.

Guidance

Members of the Workforce who use industrial machines, portable power tools, or industrial robot systems should be familiar with:




- The guarding methods for industrial machines, portable power tools, or industrial robot systems.
- How to use, adjust, and maintain the [guards](#).
- How the guards can be removed and under what circumstances.
- The training courses that are recommended to Members of the Workforce who use industrial machines, portable power tools, or industrial robot systems.
- Lockout/Tagout requirements as defined in [Section 4C](#), "Lockout/Tagout (LOTO)" and [CPR400.1.17/GN470037](#), "Administrative Control Procedure."

- 
- See the Safety Engineering Program, [Machine Shop Safety website](#) for additional information.


ESTABLISHING A SAFE WORK ENVIRONMENT

Requirements

Managers shall be responsible for ensuring that:

- 
- Relevant [technical work documents \(TWDs\)](#) are developed and implemented. TWDs are written to provide health and safety practices for operators when operating industrial machines, portable power tools, or [industrial robot systems](#) on:
 - Explosive materials or components containing explosives. (See CPR400.1.1.31/[MN471011](#), *Explosives Safety Manual* provides guidance on items containing these materials and how to safely manage such operations, along with additional requirements and standard practices).
 - Radioactive materials.
 - Materials containing constituents that pose a health hazard such as, but **not** limited to, beryllium, lead, or asbestos.

.Note: TWDs should reflect the intended use and applicability in addition to the health and safety practices. See [Chapter 21](#), "Technical Work Documents (TWDs)," for instructions on writing TWDs, or contact the appropriate [Division ES&H Team](#) for assistance.

- 
- Appropriate documentation (e.g., training records, authorizations, and permits) **not** maintained elsewhere (e.g., corporate or center records systems) is maintained in department files.

Note: Various industrial machine, portable power tool, or industrial robot system operations may require a special activity permit (i.e., Cutting, Welding, and Open Flame Permit, Confined Space Permit). See the appropriate *ES&H Manual* section for specific requirements relating to these operations and permit procedures.

- Manufacturers' service manuals or TWDs are readily available to equipment users.
- Appropriate Division ES&H Team member is consulted to initiate evaluation of noise levels due to shop, machine, and tool operations and determine how to control exposures, particularly in the case of pneumatic- and explosive-actuated tools where Members of the Workforce may need hearing-protection devices. See [Section 6H](#), "Noise Exposure and Hearing Conservation," for instructions on these exposures.
- Appropriate operating instructions for the various machines are **readily available to equipment users**, as presented in the attachments to Section 4N.

Managers who are responsible for industrial machine, portable power tool, or industrial robot systems use in a work area shall be responsible for ensuring that:

- Appropriate hazard warning signs are posted in conspicuous locations on all industrial machines (see [Section 4M](#), "Signs [Including SWHAS] and Tags." [SNL/CA] including ISMS Hazard Notice Signs).
- 2-prong, non-double insulated portable power tools, with the exception of heat guns and soldering equipment, are prohibited and **not** used.
- Red safety [stop controls](#), when designed into the machine, are conspicuously mounted and within easy reach of the operator.
- Proper use of equipment by Members of the Workforce who are from other organizations within the work area are duly trained and authorized by signing a form such as SF 2001-AMP ([Word file/Acrobat file](#)), to document which equipment the person is qualified to use.

INSTALLATION OF INDUSTRIAL MACHINES

Requirements

Members of the Workforce shall:

- Install machines in accordance with ANSI/NFPA 70, *National Electrical Code (NEC)*, requirements, including:
 - Ensuring proper grounding controls are in place.
 - Providing protection for flexible cords.
 - Ensuring conduit fittings are **not** loose.
 - Providing a means of disconnecting each machine (i.e., fuses or circuit breakers) that is conspicuously and legibly marked to indicate its purpose - unless it is located and arranged so that its purpose is obvious.
- Securely anchor industrial machines that are designed for a fixed location to prevent movement, as applicable.

Note: Some equipment is **not** designed to be fastened down. For example, fastening down lathes may distort the bed and alignment. Consult the manufacturers' or operation manuals for specific guidelines for fastening the equipment. For SNL/CA, consideration should be made to meet seismic code requirements.

- Ensure industrial machines, portable power tools, or [industrial robot systems](#) that might injure an operator if automatically restarted after a power failure, are equipped with a device that prevents automatic restart.


Note: For SNL/NM, devices that prevent automatic restart are available through the Just-in-Time (JIT) electrical supplier. Safe-Start-Plug™, model number 12-15, a magnetic motor starter, is an example of an approved device for plug-in equipment. For SNL/CA, please contact Maintenance Warehouse Operations through the [Maintenance Engineering Department](#).

- Follow the requirements of [Section 4B](#), "Electrical Safety Practices," and [CPR400.1.1.28/MN471004](#), *Electrical Safety Manual*, when installing industrial machines.

SAFETY PRECAUTIONS

Requirements

Members of the Workforce who use industrial machines, portable power tools, or [industrial robot systems](#) shall follow the safety precautions specified in the following table, as well as the specific requirements for each industrial machine and portable power tool presented in the attachments to Section 4N.

Safety Issue	Precaution
Guarding methods for portable power tools	<div style="border: 1px solid black; padding: 5px; display: inline-block;">  </div> <p>Warning: Disconnect the source of energy before changing or adjusting accessories or guards on a portable power tool.</p> <p>Ensure guards are:</p> <ul style="list-style-type: none"> ● In place above and below the base plate on electric circular saws that have a blade diameter greater than 2 inches. ● In place when using portable power tools designed to accommodate guards. ● Not altered or removed without either obtaining management approval or following authorized procedures. ● Replaced accordingly before operation, if they have been removed for making adjustments.

Constant-pressure switches or controls on portable power tools

Ensure that the following types of portable power tools are equipped with a constant-pressure switch or control that will shut off power when pressure is released and do **not** have a lock on the constant pressure switch or control.

- Percussion tools.
- Electric, hydraulic, or pneumatic chain saws.
- Hand-held circular saws having a blade diameter greater than 2 inches.

The following types of portable power tools shall be equipped with a constant-pressure switch or control and may have a lock-on control that enables the operator to turn off the power with a single motion of the same finger used to turn it on:

- Hand-held drills.
- Tappers.
- Belt sanders.
- Fastener drivers.
- Reciprocating saws.
- Disc sanders with a disc diameter greater than 2 inches.
- Saber, scroll, and jig saws with blade shanks greater than a nominal 1/4 inch.
- Horizontal, vertical, and angle grinders with wheel diameter greater than 2 inches.



Guard attachments

- Standard barrier guards shall be securely fastened to the floor, wall, or frame of the industrial machine, portable power tool, or industrial robot systems.
- Guards to industrial machines shall be affixed, where possible, or secured elsewhere if attachment to the machine is not possible.
- Guards shall be constructed of polycarbonate materials, i.e., Plexiglass™, expanded metal, perforated or solid sheet metal, wire mesh with angle iron, or iron pipe.

Note: Removing of a guard may require hazardous energy control procedures (i.e. LOTO). Refer to Lockout/Tagout procedures as defined in Section 4C, "Lockout/Tagout (LOTO)."

Power transmission guarding methods

If any of the following power transmission apparatuses are located within 7 feet or less from the floor or working surface, they shall be enclosed within a fixed barrier guard:

- Prime movers (e.g., flywheels, cranks, connecting rods).
- Shafting, either vertical or horizontal.
- Pulleys and belts.
- Gears, sprockets, and chains.

User-built guards



Ensure that custom user-built guards meet the following criteria:

- Provide point-of-operation guard protection when the manufacturer does **not** provide one for specified equipment.
- Safeguard the operator while allowing work to continue with minimum disruption to the process.
- Specifications for user-built guards have been developed through a thorough Hazard Analysis (HA).

Note: Members of the Workforce should consult the appropriate [Division ES&H Team](#) member to develop a comprehensive HA and for further instructions on operation and guarding requirements.

Members of the Workforce who use industrial machines and [industrial robot systems](#) shall ensure that one or more machine guarding methods are provided to protect the operator and other people in the work area from machine-related hazards created by point-of-operation; [pinch points](#); rotating, impacting, cutting, shearing, screwing or worming, forming or bending mechanisms; as well as projectiles (e.g., chips) and sparks.

The following types of machine guarding methods are permitted at SNL:

Type of Method	Acceptable Method Applications
Guard	Fixed, interlocked, adjustable, or self-adjusting.
Devices	Presence-sensing, gates, or safety controls (pressure-sensitive body bar, tripod/cables, two hand control/trip).
Safeguard - by location or distance	Remote operator controls machine from a safe distance.
Miscellaneous aids	Awareness barriers, protective shields, hand-feeding tools, or holding fixtures.

Feed and ejection

Automatic or robotics.

PRE-USE SAFETY CHECKS

Requirements

Members of the Workforce who use industrial machines, portable power tools, or industrial robot systems shall perform the pre-use safety checks described in the following table:

Item	Safety Check
Portable power tools	<ul style="list-style-type: none"> ● Inspect portable power tools prior to use to ensure that they are well maintained and undamaged. Check for: <ul style="list-style-type: none"> ○ Loose parts. ○ Deformed or missing pins, blades, or prongs. ○ Damage to outer jacket or insulation of the flexible cord. ○ Improper grip of the cord at the inlet to the tool, or the plug attachment. ○ <u>Guards</u> that are out of place or do not operate properly. ○ Evidence of internal damage (e.g., pinched/crushed outer jacket of cord). ● Connect portable power tools to ground fault circuit interrupters (GFCIs) before using them outside or in wet or damp locations (unless the



tools are double-insulated or battery-powered). All GFCIs shall be tested prior to use.

- Ensure that portable power tools are approved for use in an explosive atmosphere before using them in an environment that might present such a hazard.
- Remove defective equipment from service.

Industrial machines and [industrial robotic equipment](#)



Do **not** assume that a machine is in its safe operating condition. Check the following prior to use:

- Vises, cutters, tool bits, blade tension, grinding wheels, sanding belts, etc., are secured as appropriate.
- Oil levels are adequate and recheck periodically during use.
- All guards are in the proper position and secured. Report any defective or missing guards to manager.
- The dust collection system is **not** clogged.

Industrial machines and [industrial robotic equipment](#)



Ensure guards are:

- Firmly secured and allow safe lubrication.
- **Not** such that they create a new hazard.
- Installed to prevent any part of the worker's body from contacting dangerous moving parts.

OPERATING INDUSTRIAL MACHINES,

PORTABLE POWER TOOLS, AND INDUSTRIAL ROBOT SYSTEMS

Requirements

Members of the Workforce shall ensure the following safety precautions are followed when operating industrial machines, portable power tools, or [industrial robot systems](#):

- Do **not** work alone or perform hazardous operations with an industrial machine, portable power tool, or industrial robot systems without prior approval from the manager or their designee responsible for the work area. See [Section 4A](#), "Working in High-Injury-Potential/Remote Operations," for additional [information](#).
- Use caution at all times to avoid injury from:
 - Sharp cutters.
 - Flying chips.
 - Machine failure.
 - Electrical failure.
 - Operator error.
 - Direct contact with exposed moving parts of machines.
- Do **not** leave equipment unattended while in operation. Exceptions are as follows:
 - Spindles requiring warm-up cycles.
 - Machines designed for continuous operation.
- **Always** use special [hand-feed tools](#) to place and remove materials in machine danger zones.

Note: An example of a hand-feed tool would be using a push stick or block when feeding stock into a saw blade or performing similar operations on other machines.

Hand-feed tools shall **not** be used in lieu of other guarding requirements.



- **Never** reach over or around a moving part.
- **Always** allow an industrial machine, portable power tool, or [industrial robotic](#) equipment to come to a complete stop before inspecting the work or cleaning the machine or tool.
- Keep the area around industrial machines, portable power tools, and industrial robotic equipment clear - free of clutter, trip hazards, soiled rags, and flammable or combustible material.
- Adhere to the instructions in the manufacturer's operating manual, TWDs for the specific industrial machine, portable power tool, or industrial robot system, and the job request order, unless otherwise notified by the appropriate supervisor or manager.
- Wear the proper clothing/apparel and contain hair, as necessary. The following is **not** allowed:
 - Loose clothing and inappropriate apparel (i.e., improper clothes and shoes).
 - Loose jewelry (including rings, wristwatches, bracelets, and badges hanging from chains or non-break-away lanyards).
- Do **not** wear gloves while working around moving or rotating parts of industrial machines, portable power tools, or industrial robot systems such as drills, saws, shafts, gears, spindles, etc.



Note: Keep clothing, hair, and jewelry away from rotating or moving parts as they can be caught in these moving parts and cause serious injury.

- Store portable power tools after using them to prevent damage. Do **not** suspend portable power tools by the cord or hose.

Members of the Workforce shall also follow the requirements specified in the following table.

Issue	Requirement
 <p>Personal Protective Equipment (PPE)</p>	<p>Determine the appropriate level of personal protective equipment as specified in Section 4L, "Personal Protective Equipment (PPE)," for operating industrial machines, portable power tools, or industrial robot systems, if not specified in the applicable TWD. For example:</p> <ul style="list-style-type: none"> ● Wear safety glasses and a face shield when there is a potential for injury from flying particles, e.g. dust, chips, fragments, etc. ● Wear personal protective equipment when in designated areas such as machine shops and laboratories where industrial machines, portable power tools, or industrial robot systems are used. ● Operators may wear gloves when loading or handling rough stock, but shall remove the gloves prior to operation to prevent rotating parts from catching a glove and pulling the operator's hand into hazardous areas.
 <p>Machining or using hazardous materials</p>	<ul style="list-style-type: none"> ● Contact your Division ES&H Team for assistance in determining what hazardous materials cannot be machined in the designated areas. ● Consult the appropriate Material Safety Data Sheet (MSDS) to learn associated hazards before machining any material and before performing any operation with solvents, metalworking fluids, lubricants, gases, or test samples of special metals when the associated hazards are unclear or unknown.

Using pneumatic-powered tools

- Install a tool retainer on each piece of equipment that, without such a retainer, may eject the tool.
- Use only hoses and hose connections that are designed for the pressure and service to which they will be subjected when connecting compressed air to equipment.

Cleaning equipment and work areas

- Do **not** use compressed air for cleaning unless reduced to less than 30 pounds per square inch (psi) dead-end pressure and then only with effective chip guards and personal protective equipment. (At SNL/CA, the use of compressed air for cleaning equipment and work areas is prohibited.)
- Remove all chips, dust, and metal particles off machines and work benches, and place them in the appropriate waste container marked for that type of material.
- Wipe off remaining cutting oil or coolant used during the machining operation and dispose of rags in designated hazardous waste containers.
- Sweep or vacuum the entire area around each work bench or machine used and place debris in the appropriate waste container.
- Clean dust collection hoppers regularly.

Disposing of hazardous waste

- Separate petroleum rags and solvent rags into designated waste disposal cans.
- Dispose of any hazardous waste (including cleaning materials, chips, metal particles, dust, trash), according to:
 - [Section 19A](#), "Hazardous Waste Management."
 - (SNL/CA) [CPR400.1.1.37/GN470075](#), *Guidelines for Waste Generators at SNL/CA.*



*INSPECTIONS, MAINTENANCE, AND TESTING

*Requirements

Managers shall be responsible for ensuring that periodic safety inspections (performed at least annually) of industrial machines, portable power tools, or [industrial robot systems](#) are conducted and documented. Periodic inspections shall include:

- Using an inspection checklist such as SF 2001-MIC, Machine Inspection Checklist, ([Word file/Acrobat file](#)).
- Ensuring that maintenance has been performed in accordance with the manufacturer's recommendations.
- Verifying appropriate guards are in place.
- Using an inspection form such as SF 2001-PPT, Portable Power Tool Test Record, ([Word file/Acrobat file](#)).

Members of the Workforce shall follow the requirements specified in the following table.

Equipment Type	Requirements
Industrial machines and industrial robotic equipment (Including guards)	<ul style="list-style-type: none">● Provide inspections and maintain records by:<ul style="list-style-type: none">○ Setting up an annual inspection and maintenance schedule.○ Using an inspection checklist such as SF 2001-MIC, Machine Inspection Checklist, (Word file/Acrobat file).○ Servicing machines according to the manufacturers' recommendations.● Prior to maintenance or regular servicing operations:<ul style="list-style-type: none">○ Lockout and tagout (LOTO) hazardous energy sources according to the requirements and instructions in Section 4C, "Lockout/Tagout (LOTO) and CPR400.1.1.7/GN470037, "Administrative Control Procedure."○ Remove damaged or unsafe machines from service and apply administrative controls, as appropriate, until they have been repaired or disposed of properly.○ Correct defects found during maintenance and inspection.

Portable power tools

- Provide inspections and maintain records by:
 - Setting up an annual inspection and maintenance schedule.
 - Using a form such as SF 2001-PPT, Portable Power Tool Test Record ([Word file/Acrobat file](#)) to record inspections.
 - Retaining the previous year's inspection records until they are replaced by the current year's records.
 - **Ensure records are maintained in accordance with the [Sandia Records Retention and Disposition Schedule](#).**
 - Removing any damaged or unsafe portable power tool from service and tag it as out-of-service until it has been repaired or disposed of properly.
 - Correcting defects found during maintenance and inspection.
 - Servicing portable power tools according to the manufacturers' recommendations.
 - Using logs, color coding methods, or other means to distinguish records and maintain them until replaced by more current records.
- Ensure that portable power tools that are cord- and plug-connected (except 2-prong double-insulated tools) are tested:
 - Before they are used for the first time.





- Annually (at intervals not to exceed 12 months).
- After repairs.
- After suspected damage.

ROBOT SAFETY/GUARDING

Requirements

Owners and operators of [industrial robot systems](#) shall implement one, or a combination of (as appropriate) the following robotic equipment safeguards to ensure Members of the Workforce and visitors safety. Contact the appropriate [Division ES&H Team](#) for additional assistance.

Safeguard	Usage
Interlocks	To keep individuals away from potential hazards. LOTO is used for maintenance to work on equipment.
Pressure-sensitive mats	As an emergency stop to protect individuals.
Emergency stop buttons	To secure operations in an emergency.
Light curtains	For protection of individuals from point-of-operation, pass-through, and perimeter machine hazards.
Audible signal	For warning individuals of an approaching or present hazard.
Signs and lights	To inform individuals of equipment and operations.
Procedures	For proper operations of equipment.
Training	(See Training)

Guidance

Owners and operators of [industrial robot systems](#) should know that there are three categories of robotic safety:

- During manufacturing processes, including re-manufacturing processes, and rebuilding robots, etc.
- During installation of robots.
- During use of robots.

It is recommended that ANSI/RIA R15.06, "Industrial Robots and Robot Systems Safety Requirements" be used as a guide to assure that all safeguard requirements are met for installation, operation, and maintenance of [industrial robots](#) and industrial robot systems.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Electrical safety	Section 4B , "Electrical Safety Practices"
Lockout/Tagout	Section 4C , "Lockout/Tagout (LOTO)" CPR400.1.1.7/GN470037 , "Administrative Control Procedure"
Hazardous materials	Section 6D , "Hazard Communication Standard"
Personal Protective Equipment (PPE)	Section 4L , "Personal Protective Equipment (PPE)"
Hazardous waste	Chapter 19 , "Waste Management" CPR400.1.1.37/GN470075 , "Guidelines for Waste Generators at SNL/CA"
Noise	Section 6H , "Noise Exposure and Hearing Conservation"

Hazardous waste

[Section 4M](#), "Signs (Including SWHAS) and Tags"

[CPR400.1.1.7/GN470037](#), "*Administrative Control Procedure*"

REFERENCES

Requirements Source Documents

[29 CFR 1910, Subpart O](#), *Machinery and Machine Guarding*.

[29 CFR 1910, Subpart P](#), *Hand and Portable Powered Tools and Other Hand-Held Equipment*.

Implementing Documents

ANSI/NFPA 70, *National Electrical Code (NEC)*.

ANSI/RIA R15.06, *Industrial Robots and Robot Systems Safety Requirements*.

SNL, [CPR400.1.1.7/GN470037](#), *Administrative Control Procedure*.

SNL, [CPR400.1.1.37/GN470075](#), *Guidelines for Waste Generators at SNL/CA*.

SNL, [CPR400.1.1.28/MN471004](#), *Electrical Safety Manual*.

SNL, [CPR400.1.1.31/MN471011](#), *Sandia Explosives Safety Manual*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

ANSI C2-1997, *National Electrical Safety Code*.

ANSI B11.TR3-2000, Risk Assessment and Risk Reduction – A Guide to Estimate, Evaluate and Reduce Risk Associated with Machine Tools.

OSHA 3067, Concepts and Techniques of Machine Safeguarding.

SNL, CPR500.2.1, *Procurement Manual*, [Section 3.1.2.5c](#), "Restricted Items Requiring Special Processes."



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ES&H Manual

SECTION 18A – REPORTING ES&H CONCERNS AND SUGGESTIONS FOR IMPROVEMENT

Subject Matter Expert: [Chris Tolendino](#); CA Counterpart: N/A

MN471001, Issue C

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* Indicates a substantive change

- [Applicability](#)
- [Responsibilities for Reporting](#)
- [*DOE Worker Protection Poster](#)
- [Avenues for Reporting](#)
- [Responding to Threats or Penalties](#)
- [Corporate ES&H Concerns Reporting Process](#)
- [Related Hazards and Activities](#)
- [*References](#)
- Forms
 - DOE F 5480.4, DOE Contractor Employee Occupational Safety or Health Complaint ([Word file](#)/[Acrobat file](#))
 - SF 2001-QC, Reporting SNL ES&H Concerns and Suggestions for Improvement Form ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce on [Sandia-controlled premises](#).



RESPONSIBILITIES FOR REPORTING

Requirements

Managers shall be responsible for ensuring that:

- An environment is created in which individuals can raise ES&H concerns or make suggestions for ES&H improvement without fear of adverse consequences.
- All ES&H concerns that are reported to them are addressed.

Guidance

Members of the Workforce are encouraged to report ES&H concerns. See "[Avenues for Reporting](#)" for guidance on how to report various types of concerns or to make suggestions for improvement.

*DOE WORKER PROTECTION POSTER

*Requirements

Senior Managers shall ensure that the appropriate DOE worker protection poster for information and reporting processes (i.e., "Worker Protection for DOE Contractor Employees") is conspicuously posted along major personnel traffic routes in common use areas of buildings. (Some of the people that Senior Managers may enlist assistance from include Building ES&H Coordinators, ES&H Coordinators and Building Managers.) When there is no Senior Manager or Line Manager, coordination is necessary between Facilities and the affected organization(s) to assign a Building ES&H Coordinator or



ES&H Coordinator to perform the function.

AVENUES FOR REPORTING

Guidance


Members of the Workforce and visitors are encouraged to first report ES&H concerns or to make suggestions for ES&H improvement to their managers. Table 18A-1 lists additional resources that may be consulted to help address areas of concern and identify areas for improvement.



Table 18A-1. Additional Resources

Type of Concern	Resource
Emergency	Chapter 15 , "Emergency Preparedness and Management"
Facility-related	Telecon Plus through Facilities Management and Operations Center
General ES&H concerns or to make suggestions for improvement	<ul style="list-style-type: none"> • Division ES&H Team(s) • Building ES&H coordinator(s) or facility building manager(s) <p>Note: Not all divisions use building ES&H coordinators.</p> <ul style="list-style-type: none"> • Union ES&H representative(s) or coordinator(s) for union-represented employees • Various ES&H safety committees as defined in Chapter 1, Attachment 1D-3, "Standing ES&H Committees"



 <p>Non-emergency</p>	<p>Chapter 15, "Emergency Preparedness and Management"</p> <p>Note: Non-emergency hotline personnel may recommend following the steps in "Corporate ES&H Concerns Reporting Process" as defined in Table 18A-3 of this document.</p>
<p>Occurrence Reporting</p>	<p>Section 18C, "Occurrence Reporting"</p>
<p>Personnel-related</p>	<p>Ethics Office</p>
<p>Subcontractor-related</p>	<p>Sandia Delegated Representative (SDR)</p>


Members of the Workforce and visitors may use [Table 18A-3](#) as an alternative, or if a concern has been misinterpreted or resolution (or progress toward resolution) is not acceptable.

Note: Members of the Workforce may submit any type of concern directly to Sandia [Ethics Office](#) or to DOE, however, it is recommended that they attempt to get concerns resolved using one or more of the SNL resources listed in [Table 18A-1](#) before reporting to DOE agencies as described in [Table 18A-2](#).

If reporting to a DOE agency, Members of the Workforce and visitors are encouraged to use the avenues presented in Table 18A-2 when reporting ES&H-related concerns, preferably in the order listed.

Table 18A-2. Reporting to DOE

Agency	Action
	

<p>NNSA Sandia Site Office (NNSA/SSO)</p> 	<ul style="list-style-type: none"> • Call the NNSA Sandia Site Office (SSO) at (505) 845-6171 • Complete a DOE F 5480.4 Form, <i>DOE Contractor Employee Occupational Safety or Health Complaint</i> (Word file/Acrobat file). <p>Note: DOE F 5480.4 is also posted throughout SNL near DOE/OSHA posters.</p> <ul style="list-style-type: none"> • Send the written concern or Form 5480.4 to SSO —Attention: OSHA representative, DOE/SSO, P.O. Box 5400, Albuquerque, NM 87115.
<p>DOE—Office of the Inspector General (DOE/IG)</p>	<p>Call DOE/IG at 1-800-541-1625 or (202) 586-4073. The hotline is available 24 hours a day, 7 days a week. Individuals may be asked to leave a message on the answering machine.</p>

RESPONDING TO THREATS OR PENALTIES

Requirements



Managers shall **not** discharge, demote, coerce, threaten, penalize, discriminate against, or reduce the pay of any individual for reporting a concern.

Guidance

Members of the Workforce who feel that they have been threatened or penalized as a result of reporting a concern may contact:

- Their manager.
- Other management in their reporting chain.



- [Sandia's Corporate Ombuds Office.](#)
- [Sandia's Ethics Office.](#)
- [Diversity, EEO & AA Services Department \(3553\)](#)
- NNSA/SSO.

CORPORATE ES&H CONCERNS REPORTING PROCESS

Guidance



Members of the Workforce and visitors are encouraged to use the process in Table 18A-3 to report concerns.

Note: Concerns may be submitted anonymously. If the submitter chooses to remain anonymous, they will not receive a response to their concern or suggestion.

Table 18A-3. Corporate ES&H Concerns Reporting Process

Step	Action
1	<p>The concerned individual completes SF 2001-QC, Reporting SNL ES&H Concerns and Suggestions for Improvement Form (Word file/Acrobat file), and submits it to one of the following, as appropriate:</p> <ul style="list-style-type: none"> • At SNL/NM - ES&H Concerns Point of Contact: Performance Assurance (MS 0890) • At SNL/CA - ES&H Concerns Point of Contact: ES&H Hotline, 294-3724



2	Department 10312 or 8517 determines appropriate Division ES&H Team member, manager, or other corporate process (e.g., Human Resources, Corporate Ombuds) to coordinate the concern.
3	The appropriate Division ES&H Team investigates and determines an owner and potential corrective actions, if any. This may include working with the responsible Division ES&H Team coordinator or management personnel, other customer support personnel, and the person who submitted the concern.
4	The owner accepts or rejects the action item.
5	Department 10312 or 8517 enters the concern into the 10300 Corrective Action Tracking System (CATS).
6	The owner oversees the completion of corrective actions and reports back to Department 10312 or 8517 when the corrective actions are complete.
7	Department 10312 or 8517 reviews the actions and notifies the person who submitted the concern of the actions taken in response to the concern.
8	After the owner closes the action item, Department 10312 or 8517 closes the concern in the tracking database.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to reporting a concern or suggestion for improvement are referenced in the following sections:

Hazard / Activity	Reference
Occurrences	Section 18C , "Occurrence Reporting"
Releases	Section 18E , "Environmental Release Reporting"
Accidents	Section 18F , "Reporting Vehicle and Property Damage Accidents"
Injuries and illnesses	Chapter 16 , "Health, Benefits, and Employee Services"

*REFERENCES

*Requirements Source Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[DOE O 442.1A](#), *Department of Energy Employee Concerns Program*.

Related Documents

[10CFR 708](#), "DOE Contractor Employee Protection Program."

[2002 MTC Labor Agreement](#), Article 37, "Joint Environment, Safety and Health Committee," Section 10.

[2002 OPEIU Labor Agreement](#), Article 37, "Environment, Safety, and Health," Section 9.

Lockheed Martin, [Code of Ethics and Business Conduct](#).

[SPA 2001 Labor Agreement](#), Article 36, "Joint Environment, Safety, and Health," Section 36.8.3.



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ES&H Manual

SECTION 2D – PERFORM WORK

Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)

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- [Safety Management Function](#)
- [*Administrative Duties](#)
- [Startup of New Operations and Restart Following a Shutdown](#)
- [Recordkeeping](#)
- [*References](#)
- Form
 - SF 2001-QC, SNL ES&H Question/Concern Form ([Word file](#)/[Acrobat file](#))

SAFETY MANAGEMENT FUNCTION

Guidance

Managers should be aware that "perform work":

- Is the fourth safety management function of Sandia's Integrated Safety Management System (ISMS) (see [CPR 400.1.2](#), *Integrated Safety Management System [ISMS] Description*).

- Comprises those processes, program, and activities for managing and conducting work that include:
 - Confirming operational readiness.
 - Working within operational limits.
 - Taking emergency response actions, as necessary.
 - Documenting daily operations.
 - Suspending work activities when new hazards or environmental risks are introduced.



Managers should see [CPR001.3.4](#), *The Corporate Work Process (CWP)*, for additional information.

*ADMINISTRATIVE DUTIES

Guidance



Members of the Workforce should be aware of the following hazardous conditions that have the potential to exist in any work environment:

- Poor housekeeping (see [Section 4P](#), "Housekeeping")
- Obstruction of egress paths, safety signs, electrical panels, and other safety controls (see [Chapter 5](#), "Fire Protection")
- Improper preparation, consumption, and disposal of food and beverage items. See [Section 4B](#), "Electrical Safety Practices," for requirements on electrical appliances and [Section 6K](#), "Hazardous Waste Operations and Emergency Response (Hazwoper)," for requirements on separation of food and beverages from [toxic material](#). Consult Custodial Matrixed Service personnel for guidance on disposal of sharp items (e.g., can lids).



When unanticipated hazards or environmental risks are introduced, work should be paused until revised work planning, hazard, and environmental impacts are analyzed; and any additional controls are documented and approved, as appropriate.

Members of the Workforce should consult their [Division ES&H Team](#) for additional guidance.

*Information Postings

Requirements

Senior Managers shall ensure that required postings are conspicuously posted along major personnel traffic routes in common use areas of buildings. (Some of the people that Senior Managers may enlist assistance from include Building ES&H Coordinators, ES&H Coordinators, and Building Managers. Building Managers are members of the Facilities organization.) When there is no Senior Manager or Line Manager, coordination between Facilities and the affected organization(s) is necessary to assign a Building ES&H Coordinator or ES&H Coordinator to perform the function. The following safety information must be posted in a centralized location within each workplace or made accessible to all Members of the Workforce under their direction:

- SF 2001-QC, SNL ES&H Question/Concern Form ([Word file/Acrobat file](#))
- DOE F 5480.2, Occupational Safety & Health Protection Poster
- DOE F 5480.4, Occupational Safety or Health Complaint Form ([Word file/Acrobat file](#))
- OSHA 300, Log of Work-Related Injuries and Illnesses, Summary and Form
- 10 CFR 851 DOE Worker Protection [Poster](#)
- New Mexico Worker's Compensation Act Poster

Note: Not all divisions use Building ES&H Coordinators. When a Building ES&H Coordinator has not been appointed for a building or building area, the applicable ES&H Coordinator shall be responsible for this requirement.

Guidance

Managers may obtain posters and forms through their division ES&H Coordinator. Posters may also be viewed at the Required Building Postings [website](#).



Safety Meetings

Guidance

Managers should:

- Consider conducting safety meetings as a means of promoting worker awareness and involvement.
- Base the frequency and formality of safety meetings on the:
 - Nature of the hazards involved.
 - Introduction of new requirements, hazards, or Members of the Workforce.



STARTUP OF NEW OPERATIONS AND RESTART FOLLOWING A SHUTDOWN

Requirements

Managers shall ensure that Readiness Review requirements stated in [Section 13D](#), "Readiness Review Process," are met, in addition to the requirements stated in the following, where applicable:

Topic	Reference
Authorization agreements required for nuclear operations and facilities	CPR400.1.1.35/ GN470099 , <i>Authorization Agreements (AAs) for Category 1 or 2 Nuclear Facilities or High-Hazard Nonnuclear Facilities</i>

Authorization Basis documentation	Section 13A , "Hazards Identification and Classification Process" Section 13C , "Authorization Basis Process"
Fitness for duty evaluations and medical surveillance requirements	Chapter 16 , "Health, Benefits, and Employee Services"
Management standards	CPR001.3 , <i>Integrated Laboratory Management System (ILMS)</i> ; CPR001.3.4 , <i>The Corporate Work Process (CPS)</i>
Starting up and restarting activities	CPR400.1.1.21/ GN470089 , <i>Startup and Restart Process for SNL Moderate and High-Hazard Nonnuclear, Accelerator, and Nuclear Activities</i>

UNPLANNED CONDITIONS OR EVENTS AND EMERGENCY RESPONSE

Requirements

Members of the Workforce shall follow requirements in [technical work documents \(TWDs\)](#) or emergency plans that:

- Address actions to be taken in response to unplanned conditions or events and emergency conditions.
- Identify Members of the Workforce responsible for taking specific actions. Consult the appropriate [Division ES&H Team](#) for assistance.

Managers responsible for organizations, business operations, or spaces involved with an accidental injury, illness exposure, release, or property damage shall direct personnel to:

- Preserve, to the extent feasible, and/or document the accident scene. Consult the [accident scene preservation](#) contact for assistance.



Note: Preserving and documenting an accident scene may be accomplished through:

- Noting the time, location, ambient conditions, and property involved.
 - Identifying persons involved and/or witnesses and taking initial statements.
 - Roping off the area, placing barricades or guards, and otherwise limiting access to the scene.
 - Taking equipment involved out of use (if not essential to other operations).
 - Taking photographs or making diagrams of the accident.
 - Making copies of equipment and personnel logs and other pertinent records.
 - Assigning ownership or custody of evidence.
- Cooperate with investigators and assist in collecting evidence.
 - Prepare, implement, and track to completion corrective action plans and/or lessons learned as appropriate to prevent recurrence.



Guidance

Members of the Workforce should see:

- [Chapter 15](#), "Emergency Preparedness and Management," for information about responding to emergency situations (including who to call for help).
- [Chapter 18](#), "Reporting, Investigating, and Correcting ES&H Events," for information about reporting requirements, including:
 - [Section 18C](#), "Occurrence Reporting."
 - [Section 18E](#), "Environmental Release Reporting."
 - [Section 18F](#), "Reporting Vehicle Accidents and Property Damage."



- [Section 18G](#), "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances."
-

RECORDKEEPING

Requirements

Managers shall ensure that records are kept according to requirements and guidance in the *ES&H Manual*.

Note: See [CPR400.2.13](#), *Corporate Information Standards*, and [CPR001.3.3](#), *Formality of Operations Manual*, [Chapter 11](#), "Operating Records," and the [Records Management Manual](#) for more information.

Guidance

Managers should contact their [Division ES&H Team](#) for assistance in determining if any special records creation or management requirements exist for a specific program, activity, or facility.

*REFERENCES

Requirements Source Documents

[DE-AC04-94AL85000](#), *M&O Contract Between Sandia Corporation and DOE*.

[DOE O 225.1A](#), *Accident Investigation*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[10 CFR 851](#), *Worker Safety and Health Program*.

Implementing Documents

[CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

DOE F 5480.2, Occupational Safety & Health Protection Poster.

[DOE F 5480.4](#), Occupational Safety or Health Complaint Form.

[10 CFR 851](#), *DOE Worker Protection Poster*.

[OSHA 300](#), Log of Work-Related Injuries and Illnesses.

Related Documents

SNL, [CPR001.3.4](#), *The Corporate Work Process (CWP)*.

SNL, [CPR001.3.3](#), *Formality of Operations Manual*.

Final Rule Analysis, FRA 01-04, "OSHA amends the BBP Standards," Environmental Regulatory Consultants, Lockheed Martin Corporation, 2/2/2001.



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*SECTION 1D – WHO DOES WHAT


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 - [1D-5](#) - Management Responsibility for Minors
 - [1D-6](#) - Required Training for All ES&H Coordinators
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

ES&H AXIOMS AND RIGHTS

Requirements

This section defines the general [roles](#) and [responsibilities](#) for all Members of the Workforce. Specific responsibilities are defined in other chapters in this manual and supplements, and in organization-specific ES&H documents.

Definitions

The following terms have specific meaning within the context of ES&H.

- **Authority** - The expressed or implied power to perform, act, or decide.
- **Responsibility** - An obligation to take an action, make a decision or satisfy a requirement.
- **Accountability** - Liability (held answerable) for performance and/or outcomes.

Note: Responsibility can be delegated. Accountability shall not be delegated, but it can be shared.

- **Role** - A status or function performed by a person or group in a particular situation, process, or operation.
- **Activity** - When using this term refer to [activity level work](#).

ES&H Axioms

Sandia's approach to implementing ES&H is summed up in the following axioms:

- All Members of the Workforce are accountable for knowing and meeting their ES&H responsibilities, and for working safely.
- ES&H is an integral part of how Sandia conducts business.
- ES&H implementation shall be based on specifically defined requirements and guidance, and shall incorporate a graded approach that balances corporate and organizational priorities.

ES&H Rights

Note: This section includes only the ES&H rights of Members of the Workforce. Other rights that apply to Members of the Workforce are discussed in other SNL documents.

All Members of the Workforce have the right, without reprisal, to:

- Refrain from participating in operations they believe to be unsafe.
- Report operations or conditions they believe to be unsafe or noncompliant to the appropriate manager, Sandia delegated representative (SDR), or the [Non Emergency hotline](#). Anyone reporting an ES&H concern (see [Section 18A](#), "Reporting ES&H Concerns and Suggestions for Improvement," for more information) or suspending an operation (see [Attachment 1D-1](#)) at SNL is assured of protection from reprimand, retaliation, or duress. As discussed in [Section 18A](#), reports may be anonymous.
- Adhere to the reporting requirements for emergencies and non-emergencies as cited in Chapter 15, "Emergency Preparedness and Management" and Chapter 18, "Reporting, Investigating, and Correcting ES&H Events."
- Suspend operations they observe to be unsafe or noncompliant (see [Attachment 1D-1](#), "Suspending and Resuming Work," for more information).
- Access the following publications:
 - DOE safety and health publications
 - SNL safety and health programs

- Applicable standards, controls, and procedures
- DOE safety and health poster informing the worker of relevant rights and responsibilities. Refer to [Section 18A](#).
- Limited information on any OSHA Form 300 log subject to the Freedom of Information Act requirements and restrictions
- DOE Form 5484.3, which contains the name of the injured or ill worker

- Receive notification of monitoring results that indicate the worker was overexposed to hazardous materials or agents.
- Observe monitoring or measuring of hazardous materials or agents and obtain the results from the monitoring of their own exposure.
- Have a representative authorized by workers accompany DOE personnel, for matters involving safety and health, during the physical inspection of the workplace for the purpose of aiding the inspection. If no authorized representative is available, workers have the right to talk directly to DOE personnel regarding matters of safety and health.
- Request and receive results of inspections that involve safety and health and accident investigations.
- Exercise and participate in these rights on official company time.
- Report job-related fatalities, injuries, illnesses, incidents, and hazards; and make recommendations about appropriate ways to control those hazards. See CPR400.1.1/MN471001, *ES&H Manual*, Chapter 1, Section 1D, [Attachment 1D-1](#) “Suspending and Resuming Work,” and [Section 18A](#), “Reporting ES&H Concerns and Suggestions for Improvement” for examples and additional information.
- Involve workers and their elected representatives in the development of the worker safety and health program goals, objectives; performance measures; and in the identification and analysis, and control of hazards in the workplace.

Guidance

The [OOPS](#) website is a tool to assist in fulfilling reporting requirements.

ES&H Responsibilities

Requirements

All Members of the Workforce have general responsibilities for implementing Sandia's ES&H policy, [CPSR400.1](#), *Environment, Safety, and Health Policy Statement Requirement*. Sandia's matrix structure focuses two lines of responsibility on the Members of the Workforce, the organizational line (work title) and the Strategic Management Units (SMUs) (program-work role). A third area of responsibility relates to the space (work location) where work is performed. Therefore, the extent of ES&H responsibilities depends on three factors: program, organization, and space. In their daily work, and as part of feedback and continuous improvement; Members of the Workforce use due diligence and common sense in evaluating the application of the R2 A2 of this section to their work, and, if needed, recommending changes to the requirements listed in this section.

ROLES, RESPONSIBILITIES, ACCOUNTABILITIES and AUTHORITIES (R2A2) OF MEMBERS OF THE WORKFORCE

Requirements

Sandia's ES&H performance ultimately rests in the daily execution of the five core functions of ISMS by each Member of the Workforce. Responsibilities of Members of the Workforce are defined or delegated by their managers using the R2A2 discussed in this section. In addition, the following R2A2 are the minimum set required for Members of the Workforce with broad responsibilities for activities involving high risk environmental, safety and/or health hazards. As such, the descriptions of R2A2 discuss below constitutes the minimum set for such Members of the Workforce. If changes to these roles and responsibilities are made or the activities performed are medium or low risk (i.e., the new roles and responsibilities or risk level alter the associated R2A2 minimum set), then the Department Manager or team leader and supervisor shall add, remove, or modify appropriate R2A2 commensurate with the changed roles and

responsibilities and activity risk level. Members of the Workforce shall review the resulting R2A2 and recommend changes if needed. The roles, responsibilities, accountabilities and authorities of Members of the Workforce are listed in [Attachment 1D-2](#), “Roles, Responsibilities, Accountabilities and Authorities (R2A2) at SNL.” In addition, Members of the Workforce R2A2 include:

- Proper performance of ES&H controls and requirements is a condition of employment at SNL.

Roving Personnel and Visitors

Requirements

[Roving personnel](#) and [visitors](#) have the following responsibilities:

- Contacting the line manager or project manager and the space owners to inform them of the need to enter space and to ask about hazards within the space.
- Meeting all the requirements of the space to be visited and activities to be performed.
- Receiving Sandia (or equivalent) training appropriate to the space to be visited and activities to be performed.

Note: If the roving personnel or visitors are not fully trained for activity and space hazards, the roving personnel or visitors shall be under the direct observation and/or oversight of Members of the Workforce knowledgeable about the space and/or activities. Roving personnel and visitors shall not be permitted access to some radiological areas without appropriate training, even if escorted (see CPR400.1.1.32, MN471016, *Radiological Protection Procedures Manual*, [Chapter 3](#), “Radiological Training Program”). Contact the roving personnel, visitor's management, or visitor point of contact (POC) and the space owner to be visited to determine any additional training requirements or sign-offs required for the activity to be performed by the roving personnel or visitors.

For additional information on managing roving personnel, see [General Guidelines for Roving Personnel](#).

Minors

Requirements

Members of the Workforce who are 16 years of age or over, but under 18 years of age (minors) shall not perform specific activities or occupations listed in [Attachment 1D-5](#), "Management Responsibility for Minors." The R2A2 for minors include:

- Knowing the restrictions of Attachment 1D-5 and how it is applicable to their work assignment.
- Stopping work (or refraining from performing work) that involves the performance of prohibited activities or occupations.

Subject Matter Experts (SMEs)

Requirements

Roles, Responsibilities, Accountabilities and Authorities (R2A2) for Members of the Workforce apply to [SMEs](#). Specific R2A2 associated with the five core functions of ISMS for SMEs are listed in attachment 1D-2. In addition, SME R2A2 includes:

- Incorporating new or revised requirements (i.e., flowdown of requirements) from applicable ES&H regulations and applicable directives in [Appendix G](#) of the Prime Contract into current program requirements.
- Communicating to all managers and Members of the Workforce:
 - Current and proposed changes (i.e., flowdown of requirements) to their ES&H Program.
 - Current requirements through the *ES&H Manual* or other applicable corporate process requirements (CPRs), or through interim notification methods.
 - Communicating proposed changes (i.e., flowdown of requirements) to their ES&H Programs and implementing documents (e.g., affected chapter(s), section(s), and supplement(s) of the ES&H Manual) to the [Nuclear Safety Management Program](#)

[\(SMP\) Impact Coordinator](#) in the Safety Basis Department (e.g., for the use of the Unreviewed Safety Questions [USQ] process).

- Communicating changes in SME status to the [ES&H Training and Information Management Organization](#). For example, communicating changes when a SME leaves or is reassigned and is replaced with a new SME.
- Maintaining primary hazard screening (PHS) question sets and related links to the *ES&H Manual* and ES&H training courses that reflect current program requirements.
- Maintaining technical content for ES&H training courses that reflects current program requirements.
- Serving on [ES&H Standing Committees](#)
- Coordinating information with program peers, any associated standing ES&H committees, and the teams responsible for maintaining the *ES&H Manual* (or other CPRs), ISMS software modules, and ES&H courses as applicable.
- Using the Documentation of Recommendations and Tracking System (DRATS) for ES&H Evaluation Reports (ESHERS).
 - This is applicable to all SMEs who assist line management with their ES&H responsibilities in the disciplines of Industrial Hygiene (IH), Radiation Protection (RP), Safety Engineering (SE), and Environmental Protection (EP). Refer to [DRATS Operating Procedure for ESHERS](#).

For additional responsibilities on Self-Assessment, refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

ROLES, RESPONSIBILITIES, ACCOUNTABILITIES AND AUTHORITIES (R2A2) OF GROUPS

Guidance

ES&H Support Groups

While all organizations at Sandia incorporate ES&H into their daily work routines, certain organizations focus on developing and supporting ES&H programs as their primary activity. These organizations provide services and support to help all Sandia organizations meet their ES&H requirements. For information about ES&H support services, see the [ES&H and Emergency Management Center website](#) and the [ES&H Direct Access Services](#) list.

Advisory Groups

Division ES&H Support

The [ES&H and Emergency Management Center](#) provides interdisciplinary support by assigning ES&H contacts for each Division at SNL/NM. Each Division may have [subject matter experts \(SMEs\)](#) from the various disciplines including industrial hygiene, radiation protection, environmental protection, and safety engineering, as well as an ES&H coordinator representing that division or center.

Note: The [8000 Division ES&H Team](#) at SNL/CA is provided and managed by Departments 8516 and 8517.

Line Implementation Working Group (LIWG)

The [Line Implementation Working Group \(LIWG\)](#) improves and facilitates the Sandia-wide integration of ES&H requirements into work activities by linking line organizations and ES&H support organization's SMEs. Responsibilities of LIWG include:

- Communicating ES&H information and requirements among line organizations and ES&H support organizations.
- Soliciting ES&H information and requirements among line organizations and ES&H support organizations.
- Soliciting ES&H information, data, or status from the line and from ES&H support organizations.

- Representing the line's input to ES&H programs.
- Developing of ES&H assurance measures and expectations.
- Preparing for and assisting in conducting any audit/assessment by an internal or external organization.

LIWG serves as a resource for ES&H program owners early input to program development and ongoing feedback about effectiveness. LIWG also provides the standing ES&H committees with participants, (see [Attachment 1D-4](#), "Operating Process for Standing ES&H Committees") as needed, and a mechanism to assist line implementation. See the [LIWG charter](#) for complete details.

Standing ES&H Committees

This topic is detailed in [Attachment 1D-4](#), which describes the operating process for standing ES&H committees and in [Attachment 1D-3](#), which lists all currently active standing ES&H committees.

ES&H Councils

Division VPs and Center Directors may form ES&H councils to help promulgate safety management. These councils may consist of management, ES&H coordinators, and others as required, and serve the following functions:

- Serving as a forum for discussion of ES&H issues within the Division or Center.
- Providing input on decisions made by the Vice President or Director.
- Setting ES&H-related goals for programs within the organization.
- Reviewing progress in meeting goals.

Management Committees and Councils

Managers should be aware that ES&H management includes direction from the executive committees and councils described below.

Sandia Executive Safety Committee

The Sandia Executive Safety Committee is a Sandia executive management team chaired by the Laboratory Director (President). As discussed in the [committee description](#), the committee meets monthly on safety related matters. Committee responsibilities include:

- Assuring consistent and adequate implementation of safety programs throughout Sandia and its contractors.
- Facilitating management ownership of safety performance.
- Facilitating creation and maintenance of a caring safety culture in which it is easy for work to be done safely and without adverse environmental impact.
- Assuring adequate resources are allocated to address corporate safety issues.

Infrastructure Council

The [Infrastructure Council](#) (IC) assists leaders in actions to improve the effectiveness of Sandia's infrastructure, including ES&H support; to ensure balance, feasibility, and relevance to Sandia's future. The roles and responsibilities of the IC include:

- Providing overall Management of Policy Area risks, which are lab-wide and operational labs-wide Policy Areas.
- Providing a forum in which the IC Executive sponsors can identify, assess, and discuss mitigation and integration options for categories of lab-wide Policy Areas risks (e.g., financial, legal, physical, and cyber security, safety and health).
- Reviewing Policy Area risk management approaches and assessing how appropriately each Policy Area balances risk, response cost, and benefit.

For additional information on IC (VP and Director) Roles and Responsibilities, refer to the Integrated Enabling Services (IES) Management System document, [Appendix A](#).

MANAGEMENT ROLES, RESPONSIBILITIES,

ACCOUNTABILITIES AND AUTHORITIES (R2A2)

Organizational Line

Requirements

Roles, Responsibilities, Accountabilities and Authorities (R2A2) for Members of the Workforce apply to Line Managers.

Except for specific executive manager designations (i.e., President, EVP, VPs, and Directors), the R2A2 discussed in this section are aimed at the ES&H R2A2 for a Sandia manager with broad responsibilities for activities involving high risk environmental, safety and health hazards. As such, the descriptions of R2A2 below constitute the minimum set for such a manager. If changes to a manager's roles and responsibilities are made or the activities managed are medium or low risk (i.e., the new roles and responsibilities or risk level alter the associated R2A2 minimum set), then the manager shall add, remove, or modify appropriate R2A2 commensurate with the changed roles, responsibilities, and activity risk level. In conjunction with line supervision, managers shall use these descriptions, and those in [Attachment 1D-2](#), "ISMS, R2A2" to establish their individual ES&H R2A2.

Members of the Workforce shall be assigned to line organizations for the purposes of accomplishing work in support of delivery of mission products.

Line managers provide opportunities for frequent communication with workers about workplace safety and health matters. SNL has various methods of communications such as: [Training](#), [Lessons Learned](#), [ES&H Standing Committees](#), and Pre-Job Briefings.

Management Responsibilities at all Organizational Levels

President

In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), "ISMS, R2A2" also apply.

- Providing, through delegation of R2A2, to Members of the Workforce, a place of employment that is free from recognized hazards that have the potential to cause physical harm to Members of the Workforce.

- Adopting and ensuring adherence to policies, goals, and objectives for ES&H performance.
- Maintaining a work environment where Members of the Workforce value ES&H performance. For additional responsibilities for management surveillances refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

For additional roles and responsibilities (e.g., ISMS integration into Corporate Work Processes and Management Systems and the Enterprise Risk Management Process) for the Executive Office (EO), refer to [CPSR001.3](#), *Integrated Laboratory Management System (ILMS)*.

Executive Vice President (EVP) and Deputy Laboratory Director (DLD) for Laboratory Transformation

In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), “ISMS, R2A2” also apply.

The EVP and DLD play a top-level role in promoting, communicating, and establishing a culture that recognizes ES&H as critical to Sandia's success. The EVP and DLD is accountable for:

- Participating as a member of the [Laboratory Leadership Team \(LLT\)](#) and chairing the Lab Transformation Leadership Council (LTLC).
- Participating as a member of the Executive Safety Committee.
- Directing the VPs and Directors to implement Sandia's ES&H policy and requirements.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

For additional roles and responsibilities (e.g., ISMS integration into Corporate Work Processes and Management Systems and the Enterprise Risk Management Process)



for the Executive Office (EO), refer to [CPSR001.3](#), Integrated Laboratory Management System (ILMS).

Vice Presidents (VPs)

In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), “ISMS, R2A2” also apply.

See [CPSR001.3](#), *Integrated Laboratory Management System*, for roles and responsibilities, accountabilities and authorities, of SNL VPs. VPs demonstrate ownership of ES&H by:

- Clearly communicating ES&H policy and expectations to all Members of the Workforce and ensuring accountability.
- Leading and verifying management commitment to environment, safety, quality, and security.
- Building awareness by explaining and communicating to all Members of the Workforce Sandia’s policies and value relative to ES&H performance.
- Ensuring that activities conform to Sandia’s ES&H Manual, ES&H policies, laws, regulations, and internal procedural requirements.
- Assigning and evaluating performance, and ensuring accountability.
- Establishing and monitoring progress against an integrated set of operational performance objectives and risk limits for the laboratory.
- Assigning worker safety and health program responsibilities and ensuring resource allocation.
- Ensuring that those who lead and oversee work implement ISMS.
- Ensuring integration of ISMS into business systems and processes for mission accomplishment.
- Overseeing implementation of ES&H programs in operations and facilities assigned to them.

- Providing an open and supportive work environment where Members of the Workforce are free to report issues and concerns without fear or retribution.
- Reporting ES&H issues and status to executive management.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

The Vice President (VP), Infrastructure Operations and Business Management Division has the following additional R2A2:

- Ensuring management systems and processes integrate safety into Sandia’s work activities.
- Setting standards for implementation and execution of work activities.
- Establishing an ES&H organizational structure (including deployed personnel) with clear lines of [authority](#), [responsibility](#), and [accountability](#).
- Providing corporate leadership in ES&H.
- Communicating Sandia’s lessons learned to organizations they oversee and the [Laboratory Leadership Team \(LLT\)](#), the board of directors, and, as appropriate, other DOE facilities.
- Ensuring actions are taken to modify and improve management systems and processes based on event investigations, assessment results, and other lessons learned.
- Communicating Sandia’s ES&H program goals and progress achieving these goals to the [Laboratory Leadership Team \(LLT\)](#), the board of directors, and, as appropriate, other DOE facilities.
- Approving the Corporate ES&H Policy Statement Requirement, [CPSR400.1](#).



For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-

Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

Directors

In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), “ISMS, R2A2” also apply. Directors demonstrate ownership of ES&H in their centers by:

- 
- Building awareness by explaining and communicating to all Members of the Workforce Sandia’s policies and value relative to ES&H performance
 - Clearly communicating ES&H policy and expectations to all Members of the Workforce in their Center and ensuring accountability.
 - Assigning worker safety and health program responsibilities and ensuring resource allocation.
 - Ensuring that activities conform to the Sandia’s ES&H Manual, ES&H relate policies, laws, regulations, and internal procedural requirements.
 - Assigning and evaluating performance, and ensuring accountability.
 - Ensuring that those who lead and oversee work implement ISMS.
 - Ensuring integration of ISMS into business systems and processes for mission accomplishment.
 - Reporting ES&H issues and status to executive management.
- 

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

Directors shall also:

- Participate as a member of their Division ES&H Council, as required.
- Appoint a Center ES&H coordinator to support ES&H activities across the center.
- Ensure identified ES&H issues are brought to the attention of their Division ES&H council or ES&H coordinator.

The Director of ES&H and Emergency Management Center has the following additional R2A2:

- Providing specific, cost-effective technical and administrative support services, including programs and tools needed by organizations to implement ES&H.
- Ensuring the availability and currency of ES&H documentation, including the ES&H Manual.
- Serving as the [responsible individual](#) (RI) for DOE directives assigned to the ES&H and Emergency Management Center in accordance with [CPR200.2.2](#), Baseline Directives Management.
- Specifying ES&H functional areas and providing responsibility, accountability, and line authority over ES&H SMEs.
- Establishing program requirements and developing plans to communicate program requirements and Sandia's ES&H Policy in their functional area.
- Ensuring the availability, currency, and accuracy of ES&H documentation.

Senior Managers

In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), "ISMS, R2A2" also apply.

Senior Managers demonstrate ownership of ES&H in their groups by:

- Clearly communicating Sandia's ES&H policy and expectations to all Members of the Workforce in their groups/organizations and ensuring accountability.
- Assigning worker safety and health program responsibilities and ensuring

resource allocation.

- Ensuring that those who lead and oversee work implement ISMS.
- Ensuring integration of ISMS into business systems and processes for mission accomplishment. Ensuring the availability, currency, and accuracy of ES&H documentation.
- Assuming the Director's ES&H roles and responsibilities when acting for the Director.
- Monitoring compliance of department managers with ES&H policy and expectations.
- Monitoring and optimizing training, communications, and implementation of emergency response across departments.
- Reporting ES&H issues and status to executive management.
- Ensuring the availability, currency, and accuracy of ES&H documentation.

For additional responsibilities on self-assessment refer to [Section 22A](#), "ES&H Line Self-Assessment (SA) Activities."

For additional management surveillances responsibilities refer to [GN470034](#), "Performing and Documenting Management Surveillances."

Senior Managers in the ES&H and Emergency Management Center have the following additional R2A2:

- Providing specific, cost-effective technical and administrative support services, including programs and tools needed by organizations to implement ES&H.
- Ensuring the availability and currency of ES&H documentation, including the ES&H Manual.
- Specifying ES&H functional areas and providing line responsibility, accountability and line authority over ES&H SMEs.
- Establishing program requirements and developing plans to communicate

program requirements and Sandia's ES&H Policy in their functional area.

For additional responsibilities on self-assessment refer to [Section 22A](#), "ES&H Line Self-Assessment (SA) Activities."


For additional management surveillances responsibilities refer to [GN470034](#), "Performing and Documenting Management Surveillances."

Note: [AOP 04-02](#), Environmental, Safety and Health (ES&H) and Emergency Management Requirements Management Process, describes the responsibilities of ES&H functional managers and ES&H and Emergency Management Center SMEs, as well as the requirements flowdown process.


Department Managers

In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), "Summary of ES&H Responsibilities at SNL," for Line Managers at SNL also apply. Department managers provide technical leadership within their departments, are accountable for the actions of all Members of the Workforce in their department, and have primary responsibility for the health and safety of the Members of the Workforce they direct. Department managers are accountable and their ownership of ES&H is demonstrated by:

- Clearly communicating Sandia's ES&H policy and expectations to all Members of the Workforce in their department and ensuring accountability
- Ensuring that Members of the Workforce and visitors are protected from hazards of operations for which they are responsible. Refer to *ES&H Manual*, Section 4V, "[ES&H for Contracted Construction and Construction-Like Activities](#)" for applicability.
- Assigning worker safety and health program responsibilities.
- Providing leadership and oversight of ISMS implementation.
- Providing a graded approach methodology in implementation of work planning and control process so that the rigor associated with work planning and execution is commensurate with the complexity, hazards, and associated consequences of the activity.

- 
- Coordinating the participation of Members of the Workforce in their department with the project manager for any project activities. This includes determining any additional project-specific or hazard-specific training or [medical surveillance](#) requirements for individual project participants.
 - Holding their personnel accountable for complying with all hazard controls and meeting all applicable ES&H requirements. This includes preventing Members of the Workforce from working on activities or with hazards for which they are not qualified or have not completed the required training.
 - Maintaining appropriate ES&H documents and procedures applicable to work performed by Members of the Workforce in their department.
 - Ensuring the availability, currency, and accuracy of ES&H documentation.


For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”



For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

Department managers shall participate as a member of their center ES&H council.

ES&H functional managers have the following additional R2A2:

- 
- Executing roles, responsibilities, accountabilities and authorities for all aspects of specific ES&H functional areas as assigned by the Senior Manager to whom they report.
 - Providing training and qualifications requirements for and line authority over SMEs under the direction of ES&H managers.
 - Establishing program requirements and developing plans to communicate program requirements and Sandia's ES&H Policy in their functional area.
 - Ensuring that proposed changes to ES&H Program requirements are communicated to the [Nuclear SMP Impact Coordinator](#).

Note: Functional managers should assign subject matter experts (SMEs) as

appropriate. When SMEs leave a program, project, or an organization, that SME should be replaced. Communicate all appropriate changes to the [ES&H Training and Information Management Organization](#).

Team Leaders and Supervisors

Responsibilities of team leaders and supervisors are defined or delegated by their managers using the R2A2 discussed in this section. If team leaders and supervisors are not assigned, then the Department Manager assumes the R2 A2 of this section. In addition, the following R2A2 are the minimum set required for team leaders and supervisors with broad responsibilities for activities involving high risk environmental, safety and/or health hazards. As such, the descriptions of R2A2 discuss below constitutes the minimum set for such a team leader and supervisor. If changes to these roles and responsibilities are made or the activities supervised are medium or low risk (i. e., the new roles and responsibilities or risk level alter the associated R2A2 minimum set), then the team leader and supervisor shall add, remove, or modify appropriate R2A2 commensurate with the changed roles or responsibilities and activity risk level. In conjunction with their line responsible manager, each team leader and supervisor or the line responsible manager shall use the descriptions discussed below and those in [Attachment 1D-2](#), "ISMS, R2A2" to establish their individual ES&H R2A2.

- Identifying and analyzing the hazards with the work and the work environment; analyzing those including potential undesirable events (e.g., "what if" scenarios); and selecting controls necessary for the protection of workers, the public, and the environment.
- Focusing on eliminating or reducing the hazards; for any remaining hazards use a hierarchy of controls (i.e. engineered controls first, administrative controls second, and PPE last).
- Taking appropriate actions if unexpected hazards or conditions are encountered.
- Confirming readiness prior to perform scheduled work with regard to: systems (hardware and software), prerequisite controls, work environment, people, documents, tools and materials.
- Confirming field, facility, or laboratory conditions match those specified in planning and execution document(s) and procedure(s).
- Developing instructions necessary to complete work activities safely and



efficiently, including integration of specific hazard controls.

- Identifying and integrating into the instructions applicable technical, safety (ES&H, Radiation Protection, Safety Basis, etc.) and other programmatic requirements (QA, Security, Emergency Management, etc.).
- Authorizing, formally, work to proceed.
- Reviewing, analyzing, documenting, and approving changes in work scope, conditions, or execution (e.g., field changes or changes that affect the continued adequacy of hazards analysis and controls) before these changes are implemented.
- Conducting pre-job briefings to an extent appropriate for the complexity of and hazards associated with the work.
- Establishing acceptance or performance criteria necessary to verify completion of the work.
- Evaluating and reviewing of work documents for completeness and processing in accordance with approved records management procedures.
- Ensuring instances in which planning and execution of activities did not properly identify, analyze and/or control a hazard are documented for future use in preventing reoccurrence, trend analysis and lessons learned.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”



Project and Program Managers

The project manager plans and executes the project; integrates ES&H awareness, controls, and requirements into all phases and activities of the project; and coordinates with the space owner and department managers associated with the project to ensure safety of the workers and protection of the environment. Program managers have similar R2A2. The R2A2 included in [Attachment 1D-2](#), “ISMS, R2A2” apply.

Space Ownership and Use

Requirements

Space Users

All Members of the Workforce are considered users of the space(s) they work in and have personal responsibility for housekeeping and meeting all ES&H requirements relating to their activities.

Space Owners

Space owners are responsible for managing and documenting all hazards associated with the activities in their designated space or worksite. In addition to the following R2A2, the R2A2 included in [Attachment 1D-2](#), "ISMS, R2A2" also apply.

- Identifying and analyzing the hazards within the work space and the work space environment.
- Analyzing space hazards that include potential undesirable events or conditions (e.g., "what if" scenarios).
- Selecting space controls necessary for the protection of workers, the public, and the environment.
- Ensuring instructions are developed as necessary to complete work activities safely and efficiently, including integration of specific space hazard controls.
- Ensuring instructions identify applicable technical, safety (ES&H, Radiation Protection, Safety Basis, etc.) and other programmatic requirements (QA, Security, Emergency Management, etc.) and integrate these into instructions that govern work activities in the space.
- Confirming field, facility, or laboratory conditions match those specified in planning or execution document(s) and procedure(s).

Facilities Building Manager

The facilities building manager, who is a member of the Facilities (SNL/NM) Subsites Management Program, is responsible for understanding the "real property" (i.e., building systems) issues of a group of specific buildings. The building manager is a single point of contact for all facilities-related issues in a given building such as operations, maintenance, and related ES&H issues, including space occupancy and use, facility modifications, operations and maintenance.

The building manager, as the single point of contact, is responsible for the interface with Facilities in terms of both the strategic and tactical elements and services necessary to help you and your mission succeed. Building Managers are representatives of Sandia's Integrated Enabling Services (IES) SMU that integrate with Facilities and strive to provide the vital support our Labs' mission workers require so that they can perform their direct national security-related jobs as effectively and efficiently as possible. See the [Facilities Management and Operations Center](#) (FMOC) website.

- The strategic focus is on the planning, design, acquisition, and modification of a space that is tailored to meet your mission requirements, including site planning, space planning, and facility systems engineering support .
- The tactical focus is on those building-related activities necessary to keep your work place in a condition best suited to support your operation; this within the parameters and limitations of the building itself, including maintenance, moves, improvements, mitigation of mission systems interruption, and technical engineering support.
- Facilities include, Industrial Hygiene, Physical Security, Telecommunications, etc.

Note: Senior Managers shall ensure that required postings are conspicuously posted along major personnel traffic routes in common use areas of buildings. (Some of the people that Senior Managers may enlist assistance from include Building ES&H Coordinators, ES&H Coordinators, and Building Managers. Building Managers are members of the Facilities organization.) When there is no Senior Manager or Line Manager, coordination between Facilities and the affected organization(s) is necessary to assign a Building ES&H Coordinator or ES&H Coordinator to perform the function. Refer to the Building ES&H Coordinator in the topic, "Other Positions," below.

For additional responsibilities on self-assessment refer to [Section 22A](#), "ES&H Line Self-Assessment (SA) Activities."

For additional management surveillances responsibilities refer to [GN470034](#),

“Performing and Documenting Management Surveillances.”



Site Managers

Requirements

Site managers are responsible for oversight, direction, and budget allocation for the infrastructure support of that site. Infrastructure support can range from ensuring that adequate utilities are available to ensuring that property is utilized appropriately. Site managers may delegate responsibilities to subsite managers.

Sandia site managers are accountable and their ownership of ES&H is demonstrated by:

- Communicating Sandia's ES&H policy and expectations to all Members of the Workforce at their site.
- Accepting, approving, and communicating site-specific ES&H requirements and guidance at their site.
- Allocating appropriate ES&H infrastructure budget for their site.
- Reporting ES&H performance for their site to SNL executive management in accordance with [Chapter 22](#), "Feedback and Improvement Processes."
- Communicating health and safety requirements located in the [SNL 10 CFR 851 Worker Safety and Health Program Plan \(WSHPP\)](#), "Section 3.3.1" and CPR400.1.1/MN471001, *ES&H Manual*, [Section 1B](#), "What is The Scope" for all on-site SNL work activities (i.e., work activities performed on Sandia-controlled premises), and for off-site work (i.e., work activities performed on non-Sandia-controlled premises).

For additional responsibilities on self-assessment refer to [Section 22A](#), "ES&H Line Self-Assessment (SA) Activities."

For additional management surveillances responsibilities refer to [GN470034](#), "Performing and Documenting Management Surveillances."

Site managers have been identified for the following sites:

Site	Site Manager
SNL/NM	Vice President, Infrastructure Operations and Business Management Division
SNL/CA	Vice President, California Laboratory
Tonopah Test Range (TTR)	Manager, TTR
Nevada Test Site (NTS)	Manager, Nevada Programs
Kauai Test Facility (KTF)	Resident Range Manager, Kauai Facility & Range Support
Weapons Evaluation Test Laboratory/ Amarillo	Manager, Stockpile Evaluation Department III
Waste Isolation Pilot Plant (WIPP)	Manager, Carlsbad Programs Group
Yucca Mountain Project (YMP)	Manager, YMP Management

OTHER POSITIONS

ES&H Coordinators

General Information

If management in an organization decides not to appoint Members of the Workforce to these positions, the [responsibilities](#) described here revert to the management of that organization.

Roles

Requirements

The role of the Division ES&H Coordinator is to assist management in implementing and assuring ES&H performance and compliance within the division. Division ES&H coordinators have primary accountability for the responsibilities of center and building ES&H coordinators. Division ES&H coordinators may serve more than one division.

The role of the Center ES&H Coordinator is to assist staff and management in ES&H

performance and compliance. This coordinator also has an important role in the assurance of ES&H compliance as an active part of the Division Self-Assessment process.

Center ES&H coordinators may serve an individual center or several centers within one or more divisions.

Note: Center ES&H coordinators help management meet their responsibilities, but they shall not assume [accountability](#) for management. For more information, see the [ES&H Coordinator Handbook](#). The requirements and recommendations dealing with PHSs, HAs, and readiness reviews may be performed by a division ES&H coordinator or by a person appointed by a manager who has the required training, knowledge, and independence.

Responsibilities and Accountabilities

Requirements

The **Division ES&H Coordinator** is responsible and accountable for the following:

- Assuring ES&H performance and compliance within the division.*
- Leading and managing the division self-assessment process.*
- Developing division-specific policies, processes and tools to assist staff and management in ES&H performance.*
- Participating in [LIWG](#) to address division's concerns and issues, developing corporate solutions, and sharing lessons learned and best practices. Sponsor changes in corporate processes to meet the needs of the division.
- Acting as primary POC to DOE for issues and concerns with ES&H performance within the division, and providing input to decision made by the division VP.*
- Assuring non-compliant operations are suspended until corrected.*
- Reporting non-compliances to appropriate management.*
- Overseeing all ES&H coordinators in their division, including working with

management to determine the need for and/or the selection of center and building ES&H coordinators.

- Acting as the [facility manager or designee](#), where applicable.

*The coordinator assists the Division VP.

The R2A2 for Members of the Workforce at SNL included in [Attachment 1D-2](#), “ISMS, R2A2” also apply.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

The **Center ES&H Coordinator** is responsible and accountable for the following:

- Serving as the interface and principal point of contact (POC) for ES&H information flow to and from their organization, and coordinating ES&H audits or assessments of the center.
- Providing technical assistance to staff and management in meeting ES&H requirements.
- Communicating changes in requirements, lessons learned, and best practices to the staff and management.*
- Communicating problems and concerns from the staff and management to the division ES&H office, [LIWG](#), and appropriate Sandia and/or external organizations.
*
- Assuring that non-routine performance events within the Center are adequately investigated, tracked, and corrected. When appropriate, assure that DOE reporting requirements are met.*
- Participating in efforts to provide ES&H support to the Center, acting as a communication tool between the Center and the ES&H and Emergency Management Center, participating in sub teams as necessary to develop Center

and Division standards and policies, and share lessons learned and best practices.

- Oversight of the maintenance and content of ES&H documentation for their organization.*
- Keeping the Center Directors informed of the ES&H performance of their centers and potential vulnerabilities.
- Providing information to their Center Directors for appropriate ES&H resource allocations.
- Providing information to their Division ES&H coordinators and representing them when necessary.
- Acting as the Center Director's designee to respond to Center ES&H issues.*
- Reviewing primary hazard screens (PHSs) and hazard analyses (HAs) for technical accuracy and acknowledging by signature, as required by [Section 13A](#), "Hazards Identification and Classification Process," and [Section 13B](#), "Hazards Analysis Process." *
- Participating in readiness reviews, particularly for low hazard classification activities, as required by [Section 13D](#), "Readiness Review Process - Planning, Review, and Approval." *
- Participating in their Division's or Center's self-assessment process.*
- Advising on the establishment of ES&H performance measurement and reporting systems.
- Advising on the performance measures to monitor appropriate implementation of ES&H processes, practices, and procedures.
- Assisting Members of the Workforce in completing PHSs and HAs upon request.
- Coordinating self-assessments, and root cause analyses, data gathering, reporting results, and ensuring corrective actions are tracked to closure.*
- Disseminating lessons learned.



*The coordinator assists the Center Director.

The R2A2 for Members of the Workforce at SNL included in [Attachment 1D-2](#), "ISMS, R2A2" also apply.

For additional responsibilities on self-assessment refer to [Section 22A](#), "ES&H Line Self-Assessment (SA) Activities."

For additional management surveillances responsibilities refer to [GN470034](#), "Performing and Documenting Management Surveillances."

Building ES&H Coordinators

Requirements

Building ES&H coordinators are appointed by management, Division, or Center ES&H coordinators as needed. In buildings occupied by more than one organization, the appointment is negotiated with all occupant organizations. Assistant building ES&H coordinators may be designated for large buildings (e.g., one for each floor of a multi-story building).

Responsibilities of the building ES&H coordinator include:

- Ensuring that space owners have been identified for all organization-occupied space and that signs or name plates are posted identifying the owners.
- Ensuring that Sandia Workplace Hazards Awareness System (SWHAS) signs are posted at entrances of facilities or individual-use space, as needed, to identify hazards inside. For more information, see [Section 4M](#), "Signs (Including SWHAS) and Tags."
- Ensuring that required postings are conspicuously posted along major personnel traffic routes in common use areas of buildings. For more information, see [Section 2D](#), "Perform Work."
- Notifying the LIWG administrator when a building ES&H coordinator assignment changes.



For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

Note: Any additional building ES&H coordinator corporate duties shall be negotiated through LIWG.

Building Point of Contact (POC)

Requirements

Building points of contact (POCs) may be appointed by management, Division, or Center ES&H coordinators. If appointed, the building POC is listed on the building profile and is contacted by the Emergency Operations Center for additional information about operations within a building on an as-needed basis. Responsibilities of POCs include:

- Assisting in identifying hazards and controls associated with the building systems and project activities in the building.
- Becoming familiar with all uses and hazards in their building and knowing where to get answers in an emergency.
- Reviewing accidents, incidents, occurrences, and lessons learned within the organization.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

Strategic Management Units (SMUs)

Members of the Workforce may be assigned to SMUs for the purposes of [program and project management](#).

See [CPSR001.3](#), *Integrated Laboratory Management System*, for accountabilities, roles and responsibilities of the SMUs.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

Strategic Objectives

SMUs support corporate [strategic objectives](#) and are linked to work roles, [strategic contracting](#), and performance expectations through [line-of-sight](#).

Documenting Roles

All participants in a work activity are responsible as Members of the Workforce for the ES&H aspects of their actions. To ensure that ES&H aspects of a work activity are addressed sufficiently, the people who have management responsibilities or those assigned to a specific project shall be named and their ES&H-related roles, responsibilities, accountabilities and authorities defined when documents such as project plans, procedures, or work assignment sheets for an organization are developed and executed. If alternative arrangements from the generic roles, responsibilities, accountabilities and authorities presented herein are needed (e.g., [NWSMU](#) Project Directors), they shall be formally documented and communicated to all affected personnel and project interfaces.

For a detailed description of how the SMUs fit into Sandia's matrix structure, see CPR400.1.2, *Integrated Safety Management System (ISMS) Description*, [Section 2.2](#), "Flowdown of ISMS."

Overlapping Responsibilities

Requirements

Project managers, department managers, and space owners all have clear responsibilities. When these responsibilities overlap, the project manager has additional accountability for the duration of the project, for formally:

- Establishing lines of communication and authority between project roles.
- Ensuring that overlapping roles and responsibilities are clarified and

communicated.

- Documenting changes to project design basis, safety basis, project roles and responsibilities, etc.

SMU Managers

Requirements

SMU managers are accountable and their ownership of ES&H is demonstrated by:

- Ensuring that the program managers are fulfilling their ES&H responsibilities.
- Establishing management processes to ensure that all proposals, work statements, and business plans account for ES&H requirements, and that sufficient resources are budgeted to meet these requirements.

For additional responsibilities on self-assessment refer to [Section 22A](#), “ES&H Line Self-Assessment (SA) Activities.”

For additional management surveillances responsibilities refer to [GN470034](#), “Performing and Documenting Management Surveillances.”

REFERENCES

Requirements Source Documents

SNL, [CPR001.1](#), *Corporate Business Rules System Standard*.

SNL, [CPSR001.3](#), *Integrated Laboratory Management System*.

Implementing Documents

SNL, [AOP 04-02](#), *Environmental, Safety and Health (ES&H) and Emergency Management Requirements Management Process*.

SNL, [CPR001.3.3](#), *Formality of Operations Manual*.

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

SNL, [ES&H Coordinator Handbook](#).

SNL, [General Guidelines for Roving Personnel](#).

SNL, [LIWG Charter](#).

Related Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.



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ES&H Manual

SECTION 6D – HAZARD COMMUNICATION STANDARD

Subject Matter Expert: [Linda Stiles](#); CA Counterpart: [Al Buerer](#)

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*Indicates a substantive change


- [Applicability](#)
- [*Training](#)
- [*Contacting Industrial Hygienists](#)
- [*Control of Hazardous Chemicals](#)
- [Labeling](#)
- [Material Safety Data Sheets \(MSDSs\)](#)
- [Ototoxic Chemicals](#)
- [Related Hazards and Activities](#)
- [*References](#)
- *Attachments:
 - [*6D-1](#) - Manufacture, Distribution, and Import of Hazardous Chemicals
- Forms:
 - SF2001-MSR, SNL Generated MSDS Request Form ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section constitutes SNL's Hazard Communication Program (HCP), which consists of the following:

- 
- Training on [hazardous chemicals](#) in the work area (see "[Training](#)" for more information).
 - Information about:
 - Controlling [hazardous chemicals](#) (see "[Control of Hazardous Chemicals](#)," and "[Labeling](#)," for more information).
 - Hazard determination, labeling, and [material safety data sheets \(MSDSs\)](#) for chemicals that are [manufactured](#), [distributed](#), or [imported](#) by Members of the Workforce (see [Attachment 6D-1](#), "Manufacture, Distribution, and Import of Hazardous Chemicals").
 - Access to MSDSs associated with [hazardous chemicals](#) in the work area (see "[Material Safety Data Sheets \(MSDSs\)](#)," for more information).
 - Guidance for [Members of the Workforce](#) handling [ototoxic chemicals](#) in the work area (see "[Ototoxic Chemicals](#)," for more information).

This section applies to the following activities where [Members of the Workforce](#) may be exposed to [hazardous chemicals](#) in the work area under normal conditions of use or in a [foreseeable emergency](#) **and** are exempt from the requirements of [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan":

- [Treatment](#), [storage](#), and [disposal](#) (TSD) facilities:
 - At SNL/NM:
 - Hazardous Waste Management Facility (HWMF).
 - Thermal Treatment Facility (TTF).



- Corrective Action Management Unit (CAMU).
- Radioactive and Mixed Waste Management Facility (RMWMF).
- Manzano Storage Bunkers 37034, 37045, 37055, 37063, 37078, and 37118.
- Auxiliary Hot Cell Facility.

○ At SNL/CA:

- Hazardous Waste Facility.
- Mixed Waste Facility.
- Building 914 Model Shop.
- Building 979 Hazardous Materials Machine Shop.

- Hazardous waste cleanup operations (e.g., environmental restoration [ER] projects).
- Neutron generator production.
- Radioisotope production.
- Z-Machine maintenance and operation activities.
- Construction and maintenance activities.
- Custodial activities.
- Building decontamination and demolition activities.
- Responding to a [foreseeable emergency](#).
- Protective forces/security.
- Shipping and receiving services.



- Building 878 PZT Production Area.
- Fleet Services.
- [Chemical Information System.](#)



*TRAINING

Requirements

Managers shall be responsible for ensuring that Members of the Workforce complete the following required training. (Recommended courses may be used to supplement site-specific training.)

Work Activity or Role	Required	Recommended
Any activity involving potential exposure to hazardous chemicals under normal operating conditions or in foreseeable emergencies .	HAZ101	N/A
Any site-specific activity involving potential exposure to hazardous chemicals under normal operating conditions or in foreseeable emergencies .	HAZ103	N/A
Members of the Workforce identified as beryllium-associated workers .	BEA101	N/A
Members of the Workforce who are not beryllium-associated workers , but who work at a site where beryllium activities are conducted.	BEA100	N/A
Work involving solvents, solvent-based products, or compounds that are highly evaporative or flammable.	N/A	HAZ202



Work involving corrosive material, strong cleaning or floor-stripping agents containing corrosive material, plating or etching operations, and batteries of all types. Corrosive materials include acids, bases, caustics, or alkaline compounds.	N/A	HAZ208
Work involving flammable and combustible substances, the associated hazards to workers, required personal protective equipment , procedures for fire fighting, storage and handling, and spills and leaks.	N/A	HAZ215
All Members of the Workforce who may be exposed to an ototoxic chemical , either by itself or in concert with high-noise or high ultrasound level hazards.	N/A	NSE100 (annually)

Managers shall ensure that [Members of the Workforce](#) receive information and training regarding [hazardous chemicals](#) in their work area:

- At the time of their initial assignment.
- Whenever a new [physical hazard](#) or [health hazard](#) is introduced into their work area and [Members of the Workforce](#) have not previously been trained on the new hazard.
- Whenever they are identified as [beryllium-associated workers](#) or as other workers who are present at a site where [beryllium activities](#) are conducted.

Managers shall ensure that [Members of the Workforce](#) who use [hazardous chemicals](#) are provided with the following site-specific information:

- Location, availability, and requirements of SNL's written Hazard Communication Program (HCP) (see "[Applicability](#)" for more information on HCP).
- Location and availability of the chemical inventory (see [Chemical Information System \[CIS\] for site-specific lists of hazardous chemicals](#)) and corresponding [material safety data sheets \(MSDSs\)](#) for their work area.

- Any operations in their work area where [hazardous chemicals](#) are present.

Managers shall ensure that [Members of the Workforce](#) who use [hazardous chemicals](#) are provided with the following site-specific training:

- Methods and observations that may be used to detect the presence or release of a [hazardous chemical](#) in their work area (continuous air monitoring, visual appearance or odor of hazardous chemicals).
- The [physical hazards](#) and [health hazard](#) of the chemicals in the work area.
- The measures [Members of the Workforce](#) can take to protect themselves from hazardous chemicals (appropriate work practices, emergency procedures, and [personal protective equipment](#)).

Guidance

Managers should contact their [Division ES&H Team](#) for assistance in providing training.

*CONTACTING INDUSTRIAL HYGIENISTS

Requirements

Managers shall be responsible for ensuring that the Industrial Hygienist supporting the Division is contacted whenever an activity is planned that:

- Involves an OSHA-regulated substance listed in [29 CFR 1910, Subpart Z](#) (Sections 1001-1052), "Toxic and Hazardous Substances," any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater, or there is the potential for exposure to [ototoxic chemicals](#) .
- Has the potential to expose a worker to a hazardous chemical above regulatory exposure limits ([OSHA Permissible Exposure Limits \[PELs\]](#), [DOE Action Level \(beryllium\)](#), or [ACGIH Threshold Limit Values \[TLVs\]](#)).

- Involves hazards associated with non-routine tasks and chemicals contained in unlabeled pipes.
- Will involve hazardous chemicals that are manufactured, distributed, or imported.



*CONTROL OF HAZARDOUS CHEMICALS

Requirements

Managers shall be responsible for ensuring that:

- Members of the Workforce exposure to hazardous substances is controlled such that they do not exceed OSHA's Permissible Exposure Limits (PELs) or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), whichever limit is most restrictive (see "Contacting Industrial Hygienists").
- Members of the Workforce meet applicable requirements of OSHA-regulated substances listed in 29 CFR 1910, Subpart Z, *Toxic and Hazardous Substances*, and the requirements in 10 CFR 850, *Chronic Beryllium Disease Prevention Program*, as tailored to SNL in *ES&H Manual, Section 6Z*, "Chronic Beryllium Disease Prevention Program" (see "Contacting Industrial Hygienists").
- A list of the hazardous chemicals (using identities referenced on the appropriate material safety data sheets [MSDSs]) known to be present in the work area exists and is accessible to Members of the Workforce (see the SNL CIS website for lists of hazardous chemicals present in the work area and MSDSs).
- Members of the Workforce are informed of the hazards associated with non-routine tasks and chemicals contained in unlabeled pipes. (This may be accomplished through site-specific training, health and safety meetings, and technical work documents [TWDs]).
- Additional provisions for hearing conservation are made for those who are potentially exposed to ototoxic chemicals (see "Ototoxic Chemicals," for more information).



Space ES&H owners (see [Section 1D](#), "Who Does What," for more information) shall ensure non-Members of the Workforce (e.g., visitors, subcontractors) who may be exposed to SNL hazardous chemicals in the work area under normal conditions of use or in a [foreseeable emergency](#):

- Have access to [MSDSs](#) for each SNL-owned [hazardous chemical](#) to which they may be exposed.
- Are informed of precautionary measures (e.g., [personal protective equipment \[PPE\]](#), alarms) to protect [Members of the Workforce](#) during normal operating conditions and [foreseeable emergencies](#).
- Are informed of any labeling systems ([which are not self-explanatory](#)) used in the work area.

Managers of [Sandia-controlled premises](#) where [hazardous chemicals](#) are [manufactured](#), [distributed](#), or [imported](#) shall be responsible for ensuring that [Members of the Workforce](#) understand and comply with all requirements defined in [ES&H Manual, Attachment 6D-1](#), "Manufacture, Distribution, and Import of Hazardous Chemicals."

Guidance

[Members of the Workforce](#) should call the [Chemical Information System \(CIS\) contact](#) for assistance with or questions about their site chemical inventory. Space owners may use the [Facilities Management and Operations Center \(FMOC\) Job Site Hazard Evaluation \(JSHE\) process](#), Sandia Workplace Hazards Awareness System (SWHAS) signs, [MSDSs](#), or [TWDs](#), to inform non-Members of the Workforce of precautionary measures and labeling systems.

LABELING

Requirements

Managers shall be responsible for ensuring that each container of [hazardous chemicals](#) in their work area is labeled, tagged, or marked with the following information:

- Identity of the [hazardous chemicals](#) contained in the work area.
- Appropriate hazard warnings (or words, pictures, symbols, or a combination thereof, that provide at least general information regarding the hazards of the chemical).

Note: Labels are **not** required on portable containers into which [hazardous chemicals](#) are transferred from labeled containers, if the portable container is intended for immediate use by [Members of the Workforce](#) performing the transfer.

Managers shall be responsible for ensuring that:

- Labels or other forms of warning are legible, in English, and prominently displayed on the container, or that alternative forms of labeling (e.g., process sheets, [operating procedures \[OPs\]](#)) are readily available in the work area throughout each work shift.
- Any significant new information regarding the hazards of a chemical is added to the label for the chemical within three months of becoming aware of the new information.
- Existing labels on incoming containers of [hazardous chemicals](#) are not removed or defaced, unless the container is immediately marked with the required information.

Guidance

Members of the Workforce:

- May use signs, placards, process sheets, batch tickets, [OPs](#), or other written material in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the container(s) to which it applies, is readily available to [Members of the Workforce](#) using the [hazardous chemical](#), and conveys the required information.
- Should contact their [Division ES&H Team](#) for assistance in interpreting labels or creating label information for [hazardous chemicals](#).

MATERIAL SAFETY DATA SHEETS (MSDSs)

Requirements

Managers shall be responsible for ensuring that:

- Members of the Workforce have access to a current [material safety data sheet \(MSDS\)](#) for each [hazardous chemical](#) that they use.

Note : Use SF 2001-MSR, SNL Generated MSDS Request Form ([Word file/ Acrobat file](#)), to request an [MSDS](#) for SNL-generated material.

- [MSDSs](#) are readily accessible during each work shift to [Members of the Workforce](#) in the work area(s).

Note: Additional requirements for obtaining or developing [MSDSs](#) apply when chemicals are [manufactured](#), [distributed](#), or [imported](#) by [Members of the Workforce](#) (see [Attachment 6D-1](#)).

Guidance

Electronic access to the [Chemical Information System \(CIS\)](#), microfiche, and other alternatives to paper copies of [MSDSs](#) are permitted as long as no barriers to immediate [Members of the Workforce](#) access in each work area are created by such options.

[Members of the Workforce](#) should call the [MSDS contact](#) for assistance in entering or accessing [MSDSs](#).

OTOTOXIC CHEMICALS

Guidance

Managers should refer to [ES&H Manual, Section 6E](#), "Laboratory Standard – Chemical Hygiene Plan," under the topic, "Ototoxic Chemicals," for specific guidance on

exposures to ototoxic chemicals. For more information on noise exposure and hearing conservation requirements, see *ES&H Manual*, [Section 6H](#), "Noise Exposure and Hearing Conservation."

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to hazard communication standards include, but are not limited to:

Hazard/Activity	Reference
Asbestos	Section 6B , "Asbestos"
Beryllium	Section 6Z , "Chronic Beryllium Disease Prevention Program"
Chemical Information System (CIS)	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Chemical substances as identified in 40 CFR, Subchapter R, <i>Toxic Substances Control Act (TSCA)</i>	Section 6S , "Toxic Substances Control Act (TSCA)"
Disposal of hazardous material	Chapter 10 , "Environmental Protection" Section 19A , "Hazardous Waste Management"
Explosives	Chapter 9 , "Explosives Safety"
Fire extinguishers, material storage, flammable and combustible liquids, compressed gases	Chapter 5 , "Fire Protection"
Labeling and removal of chemical waste	Section 19A , "Hazardous Waste Management"
Activities covered by the Laboratory Standard	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Lead	Section 10L , "Management of Excess Metallic Lead"
Local exhaust ventilation (LEV) (e. g., laboratory hoods)	Section 6P , "Local Exhaust Ventilation (LEV)"

Medical surveillance	Chapter 16 , "Health, Benefits, and Employee Services"
Movement of hazardous material	Chapter 12 , "Packaging and Transportation of Hazardous Material"
Personal protective equipment (PPE) and clothing	Section 4L , "Personal Protective Equipment (PPE)"
Respiratory protection for inhalation hazards	Section 6C , "Respiratory Protection"
Safety showers and eyewashes	Section 6M , "Safety Showers and Eyewashes"
Separation of eating and drinking from toxic material	Section 6L , "Eating and Drinking"
Signs	Section 4M , Signs (Including SWHAS) and Tags
Spills and accidents involving hazardous material	Section 6K , "Hazardous Waste Operations and Emergency Response (HAZWOPER)" Section 10E , "Chemical Spills" Chapter 15 , "Emergency Preparedness and Management"

*REFERENCES

Requirements Source Documents

[10 CFR 850](#), *Chronic Beryllium Disease Prevention Program*.

[29 CFR 1910.1200](#), *Hazard Communication*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

[29 CFR 1910, Subpart Z](#), *Toxic and Hazardous Substances*.

[29 CFR 1910.120](#), *Hazardous Waste Operations and Emergency Response*.

[29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories*.

[40 CFR 700-789](#), *TSCA Implementing Regulations*.

SNL, CPR400.1.1.24/[GN470094](#), *Handling Chemicals at SNL/CA*.

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

American Conference of Governmental Industrial Hygienists (ACGIH), *2006 TLVs[®] and BEIs[®] Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, Cincinnati, OH, latest edition.

International Agency for Research on Cancer (IARC), *Monographs*.

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ES&H Manual

SECTION 4K –TRAFFIC SAFETY

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APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

For purposes of this document, a visitor is anyone who is not routinely assigned by SNL management to perform work in the area being visited.

This section applies to all Members of the Workforce and visitors:

- Whose activities on [Sandia-controlled premises](#) involve [vehicles](#), [motorized equipment](#), [powered carts](#), bicycles, and pedestrians.
- Who operate government vehicles while on official Sandia business.

*GENERAL TRAFFIC RULES

Purpose

To ensure traffic safety at Sandia National Laboratories (SNL) by providing general traffic rules and guidelines for vehicles, motorized equipment, powered carts, bicycles, and pedestrians.

Note: For roles and responsibilities of the Traffic Safety Committee see the Traffic Safety Committee [charter](#).

*Requirements

Note: Members of the Workforce (MOW) shall communicate traffic safety requirements to their visitors where applicable.

Members of the Workforce, on Sandia-controlled premises, outside of [Kirtland Air Force Base](#) (KAFB) are subject to the requirements in this section and the traffic rules applicable to the state and site in which they are located.

When operating [vehicles](#), [motorized equipment](#), [powered carts](#), or bicycles on [Sandia-controlled premises](#) or operating Sandia-controlled vehicles while on official Sandia

business, Members of the Workforce and [visitors](#) shall:

- Wear seat belts, **whether a driver operating motorized or electric vehicles or a passenger in motorized or electric vehicles.**
- **Observe all traffic control signs and devices.**
- Yield the right of way to pedestrians.
- **Report ES&H problems, concerns, or suggestions for improvement.**
- Yield the right of way to emergency and security response vehicles when an emergency or security response vehicle approaches from any direction using flashing lights and/or sirens as follows:
 - Clear the intersection.
 - Pull to the right side of the road.
 - Stop, and remain stopped until the emergency vehicle has cleared the area.
- **Not** pass vehicles yielding to a pedestrian.



CAUTION

At SNL/NM, **MOW** and visitors are subject to traffic citations issued by Sandia and **KAFB security police**. At other Sandia-controlled premises, Members of the Workforce and visitors are subject to applicable state and site-specific citations.

Managers shall be responsible for ensuring that **MOW** who operate emergency or security response vehicles drive with due regard for the safety of all persons.

Members of the Workforce who operate emergency or security response vehicles shall:

- Drive appropriate to road and weather conditions while not exceeding the posted speed limit.
- **Not** jeopardize public safety or motorized equipment during normal operation of the vehicle.

Note: **Emergency or security MOW** who operate emergency or security response

vehicles may deviate from traffic rules (including speed limits) when responding to an emergency using flashing lights and/or sirens, when reasonably necessary. However, this does not relieve MOW from the requirement to drive with due regard for public safety, nor does it protect drivers from the consequences of reckless disregard for the safety of others.

*PARKING OF GOVERNMENT AND CONSTRUCTION CONTRACTOR VEHICLES

*Requirements

MOW who operate government vehicles shall:

- Park in designated government vehicle parking spaces when available. If designated government vehicle parking areas are full or no spaces are available, parking is permitted in non-designated, full-sized vehicle parking spaces. If additional parking spaces for government vehicles are needed contact Telecon.
 - For SNL/CA, contact Facilities Engineering.
- **Not** use government vehicles to reserve open vehicle parking spaces. Park government vehicles **only** in designated government vehicle parking spaces overnight.
- **Not** back into diagonal parking stalls.

Contractors operating company vehicles may use open parking spaces on a daily basis, however, shall:

- **Not** use the company vehicle to reserve parking spaces overnight.

Guidance

MOW and visitors can use the [Quick Reference Traffic Guide for Sandia National Laboratories New Mexico](#) as a reference guide to traffic rules.

MOW and visitors can use the [Sandia National Laboratories Safe Drivers Incentive Guidelines](#) to develop Incentive programs for their organization.

*VEHICLES AND MOTORIZED EQUIPMENT

*Requirements

MOW and [visitors](#) who operate [vehicles](#) or [motorized equipment](#) shall:

- Have a valid driver's license that complies with the classification of the vehicle or motorized equipment they are operating.
- Ensure that passengers buckle seat belts and utilize shoulder harnesses on vehicles and motorized equipment so equipped, including the use of infant/child restraint devices, before operating the vehicle.
- Report any traffic citation or accident incurred while on Sandia business and off-the-job citations that might affect the Member of the Workforce's right to operate a vehicle to their managers. See [Section 18F](#), "Reporting Vehicle and Property Damage Accidents," for more information.
- Reduce speed when approaching a pedestrian within any marked or unmarked crosswalk and take any other actions to ensure the safety of pedestrians.
- Ensure that motorized equipment driven at less than 25 mph in areas where the posted speed limit is greater than 25 mph displays a slow-moving-vehicle emblem (a fluorescent yellow-orange triangle) or a flashing yellow light on the center rear section of the equipment. Motorized equipment may also use flashers to indicate speeds less than the posted limit.
- Allow a distance of no less than 5 feet when passing bicyclists.
- Not use cellular telephones while driving on KAFB unless a hands-free device is used. MOW who do not own such a device shall pull over and park the vehicle prior to using a cell phone.



- **Not use cellular phones in and near (about 50 feet from) base gates.**
- **Not use or authorize the use of SNL vehicles or motorized equipment for purposes other than official Sandia purposes.**
- **Not operate portable headphones, earphones, or other similar devices while operating a vehicle or motorized equipment.**
- **Not smoke while operating government vehicles or motorized equipment.**

MOW and visitors who operate private vehicles on [Sandia-controlled premises](#) shall have in their possession during operation:

- A valid state vehicle registration.
- A valid state driver's license.
- Proof of insurance.
- A Sandia National Laboratories decal or visitor's pass if a private vehicle is operated within KAFB boundaries.



Guidance

MOW and visitors who operate vehicles or motorized equipment should:

- Check vehicle safety features for correct adjustment and proper function of rear view mirrors, lights, turn signals, brakes, seat belts, and windshield wipers.
- Become familiar with all controls before operating an unfamiliar vehicle.



*POWERED CARTS

*Requirements

MOW shall follow the [powered cart](#) instructions in [Section 4S](#), "Use of Powered Carts."

Managers to whom carts are assigned shall ensure that all **MOW** who operate carts **have read and understand** the cart's operating procedures, restrictions, and limitations.

*MOTORCYCLES

*Requirements

MOW and visitors who operate a motorcycle on KAFB and Sandia-controlled premises shall:

- Complete KAFB's safety course IV-A or IV-B or equivalent.
Note: Equivalent courses can be taken through the City of Albuquerque. For details, contact any motorcycle dealership in Albuquerque.
 - For SNL/CA, follow applicable requirements as defined in the [California Vehicle Code](#).
- Possess a valid state motorcycle endorsement.

Note: Operators who possess a state motorcycle license endorsement from a SNELL Memorial Foundation (SMF) approved training course are exempt from the KAFB safety course requirement.

- Wear an upper garment containing a minimum of 144 square inches of one of the following authorized bright/contrasting colors: International Orange, International Red, International Yellow, etc. The garment must be reflective for use during hours of darkness and limited visibility. This garment must be worn as the outermost layer of clothing. If in doubt, personnel may contact the 377 ABW Ground Safety Office to schedule an inspection of their upper garments to ensure they meet all requirements.
 - For SNL/CA, follow applicable requirements as defined in the [California Vehicle Code](#).
- Ensure that the helmet type meets the standards of either the American Society for Testing and Materials (ASTM) or the United States Consumer Product Safety

Commission (CPSC) and has been approved by the Department of Transportation, the SMF, American National Standards Institute (ANSI), the Vehicle Safety Commission, or the Safety Helmet Council of America. An example is shown below:



- Wear an approved safety helmet that is securely fastened on the head in a normal manner.
- Wear sturdy footwear, full leg covering, impact-resistant goggles or a full-face shield, and full-fingered gloves.
- Secure packages to the motorcycle or a person in such a manner as not to interfere with the safe and proper operation of the motorcycle.
- Park in designated motorcycle parking areas.
 - SNL/CA – Motorcycles can park in any available vehicle stall or location as long as the normal flow of vehicular and pedestrian traffic is not impeded.
- Turn the headlights on, day and night.
- Ensure that passengers are:
 - Wearing the appropriate protective clothing and eye protection.
 - Riding only on a motorcycle designed to carry passengers and only on a seat permanently installed for that purpose.
 - Riding astride (a sidecar excepted) facing forward.
 - Using the foot rests and can reach the foot rests.
 - **Not** interfering with the operation of the motorcycle.
 - **Not** under five years of age.

- Ensure that:

- The handlebars are not higher than 15 inches above the level of the seat when the seat is fully depressed, and
- The motorcycle is able to make a 90-degree turn in less than 14 feet.
- The motorcycle has two rearview mirrors, one located on each handlebar.

- **Not:**

- Park on lawns, **walkways**, or adjacent to buildings.
- Wear tinted shield, goggles, or glasses after dusk and before dawn that obstructs or reduces vision.
- Operate two or more motorcycles abreast in a single lane.
- Cling to another vehicle while in motion.
- Smoke.

Note 1: If **designated motorcycle** parking areas are **full or no spaces are** available, parking is permitted in **non-designated, full-sized** vehicle parking spaces. **If additional motorcycle parking is needed contact [Telecon](#).**

Note 2: Consult the [Traffic Safety Committee](#) contact for additional information.

*MOPEDS

Note: The following requirements apply to SNL/NM only.

*Requirements

Mopeds may be ridden as bicycles while inside the technical areas (streets only) of Sandia. MOW and visitors who operate a moped on KAFB and Sandia-controlled

premises shall:

- Park mopeds in areas designated for bicycles.
- Disengage the motor and propel the moped by human power when operating on a designated bicycle path.
- Give an audible signal (horn, bell, or voice) when overtaking a pedestrian.
- **Not** allow passengers.
- **Not** park on sidewalks, lawn, or other grassed areas, or adjacent to or against buildings.



*SKATING

Note: The following requirements and guidance applies to SNL/NM only.

*Requirements

MOW and visitors who participate in skating activities (including in-line skates, coasters, roller skates, skateboards, and scooters) on Sandia-controlled premises shall:

- Wear helmets while using in-line skates, roller skates, skateboards, and scooters.
- Limit skating activities to level graded areas.
- Give an audible signal (horn, bell, or voice) when overtaking a pedestrian.
- **Not** participate in skating activities:
 - During hours of high vehicle and pedestrian traffic.
 - When participation causes safety hazards to **MOW** and the public.
 - When participation destroys government or personal property.



Note: Skating activities are prohibited on all hilly locations within the property protection area (PPA) (e.g., T-City) and are not permitted between parked vehicles.

Guidance




MOW and visitors should use additional personal protective equipment such as elbow/knee pads, wrist guards, and gloves during skating activities.

*BICYCLES

*Requirements

MOW and [visitors](#) shall:

- Be granted all rights to the roadways and are subject to all of the traffic rules applicable to the driver of a motor vehicle except those provisions, which by their very nature can have application.
- Wear a safety helmet while riding a bicycle. Safety helmets must meet the standards of either the American Society for Testing and Materials or the US Consumer Product Safety Commission while riding a bicycle on KAFB and Sandia-controlled premises unless otherwise **posted**.
- Observe all **posted signs, devices, markings, and patterns (including traffic-related signs in construction zones)**.
- **Dismount and walk the bicycle through a pedestrian gate when entering or leaving a technical area.**
- Operate in single file on the far right side of the roadway **in the designated bike lane or as far right as practical**.
- Report bicycle accidents on Sandia-controlled premises using the appropriate emergency or non-emergency phone number (see [Chapter 15](#), "Emergency Preparedness and Management").

- 
- Wear a brightly colored jersey, vest, or jacket as an outer garment during the day; and a reflective jersey, vest, or jacket as an outer garment at night. The upper garment must contain a minimum of 144 square inches of one of the following authorized bright/contrasting colors: International Orange, International Red, International Yellow, etc. The garment must be reflective for use during hours of darkness and limited visibility. This garment must be worn as the outermost layer of clothing and cover backpacks if worn.
 - SNL/CA – Wear a brightly colored or contrasting jersey, vest or jacket as an outer garment during the day when riding outside technical areas.
 - MOW and visitors shall **Not**:
 - Ride against the flow of traffic.
 - Take bicycles inside SNL buildings.
 - Park within 15 feet of a building entrance, steps, or ramp, except in clearly designated parking areas.
 - Lock bicycles to hand railings where the bicycles can create a safety hazard to persons entering or exiting a building.
 - Operate portable headphones, earphones, or other similar devices while bicycling in a traffic environment.
 - Carry any package, bundle or article which prevents the operator from keeping at least one hand on the handle bars.
 - SNL/CA – Packages, articles, etc. shall be placed in a basket for transporting or another means of transportation shall be obtained.
 - Attach themselves, their bicycle, coaster, roller skates, skateboard, sled, scooter, or toy vehicle to another motor vehicle **in motion**.
 - Ride on sidewalks within technical areas except in the mall areas leading to gates or bicycle parking areas.
- 
- 

Note: Bicyclists may **only** ride on sidewalks on **Wyoming Boulevard between F Avenue and the Wyoming gate**. MOW and visitors who ride a bicycle on Sandia-controlled

premises after dusk and before dawn or during periods of reduced visibility shall ensure that the bicycle is equipped as follows:

- With a light that emits a white light visible from a distance of at least 500 feet to the front.
- With a red reflector approved by the Motor Vehicle Division attached to the rear of the bicycle visible from 300 feet to the rear when directly in front of lawful high beams or headlights on motor [vehicles](#). A light emitting a red light visible for a distance of 500 feet to the rear may be used in addition to the red reflector.



- At **SNL/CA**:

- With a light that emits a white light visible from a distance 300 feet in front and from the sides, a lamp, or lamp combination emitting a white light visible from a distance of 300 feet in front and on the sides attached to the rider.
- With a red reflector approved by the Division of Motor Vehicles attached to the rear of the bicycle and visible from a distance of 500 feet to the rear.
- With reflectors attached to the pedals and wheels of the bicycle visible from a distance of 200 feet.

Guidance

When riding a bicycle, **MOW** should:



- Use appropriate arm signals to indicate the intention to turn or to stop.
- Ride on the appropriate side of the roadway corresponding with the flow of traffic.
- Use off-road facilities (trails or paths) where available.
- Only have one person ride on the bike unless the bicycle is specifically designed (i. e., a tandem bike) to carry two people.
- Ride in a single file on designated bike paths.
- Give an audible signal (horn, bell, or voice) when overtaking a pedestrian.



- SNL/CA – Bicycle operations should not take place before dawn or after dusk. If such operations are necessary, reflective clothing should be worn.
-

*PEDESTRIANS

*Requirements

MOW and [visitors](#) shall:

- Follow all posted traffic signs, **devices**, markings, and patterns (including traffic-related signs in construction zones).
- Observe all traffic rules, as appropriate. yield to all vehicles when crossing a roadway at any point other than within a marked crosswalk or within a crosswalk at an intersection.
- Exercise caution when entering a crosswalk; make eye contact with drivers when crossing streets or crosswalks, and avoid blindly stepping off curbs.
- Yield the right of way to emergency and security response vehicles when an emergency or security response vehicle approaches from any direction using flashing lights and/or sirens.
- **Not:**
 - Walk in the street **when walkways or** sidewalks are available. Wear portable headphones, earphones, or other similar devices while skating, skateboarding, jogging, or walking in a traffic environment.
 - Hitchhike on KAFB.
 - Walk in any landscaped areas.



Guidance

CAUTION

MOW and visitors that are considered pedestrians have the right-of-way within all Sandia-controlled areas at all times. However, pedestrians should always use caution and never step into oncoming traffic with the expectation that the [vehicle](#) will yield. Pedestrians should never assume that a vehicle will always yield to them.



Where sidewalks are not available pedestrians should:

- Walk or jog on the left side of the street facing oncoming traffic, unless prohibited, and step onto the shoulder when a vehicle approaches.
- Wear a reflective jersey, vest, belt, or jacket after dusk and before dawn.

*PARKING

*Requirements

MOW and visitors shall:

- Park only in designated parking areas and display proper permits as applicable.

Note: Designated parking is only allowed for Government, Visitor, Carpool/ Vanpool, Loading/Unloading, Medical, Handicapped, Shift Parking, Protocol, Cart, Motorcycle, Patient, etc. **Organizational/Department/Building-specific** parking is not permitted.

- **Not** stop or park in the following locations, unless it is an emergency or otherwise permitted or authorized:
 - In any area with a red or yellow curb, or otherwise designated "No Parking."
 - In any area with a blue curb.
 - In a medical, handicapped, car pool, second shift, protocol, or other specifically designated parking spot.
 - On a sidewalk or crosswalk.



- In front of a driveway.
 - Within 20 feet of a perimeter fence.
 - Within 15 feet of a fire hydrant.
 - Within 20 feet of a crosswalk at an intersection.
 - On a bridge.
 - Within 50 feet in front of or 10 feet to either side of a dumpster.
 - Alongside street excavations or obstructions.
 - Near doorways of a building blocking easy egress for emergency situations. This requirement includes government vehicles.
 - Within 15 feet of building air intake systems.
 - Within any established construction zone.
 - On the left side of the street facing oncoming traffic.
 - Within any landscaped area.
- MOW and visitors should not stop, stand, sit, loiter, or park, a vehicle on public or private bicycle paths or trails, if the activity impedes or blocks the normal and reasonable movement of vehicles, except when necessary to avoid conflict with other traffic or in compliance with law or the directions of security forces personnel or a traffic-control device.

Note: Additional information can be found in CPR400.3.11, Access Controls, [Attachment B](#), "Parking Rules and Contacts" and the [Sandia National Laboratories/New Mexico Parking Regulations document](#).

Guidance

MOW and visitors parking vehicles in parking lots while on extended trips should notify

Sandia's security office of their intentions. At SNL/NM, **MOW** and visitors should call 844-3114(South) or 844-4657(North).


CAUTION

Protective Force (ProForce) officers and KAFB security police may impound abandoned vehicles at the owner's expense and dispose of them.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Motor carrier regulations	CPR400.1.1.17/ GN470084 , <i>Complying with Federal Motor Carrier Safety Regulations</i>
Moving equipment operation	CPR400.1.1.27/ GN470097 , <i>Operating Light and Heavy Earth Moving Equipment</i>
Accident reporting	Section 18F , "Reporting Vehicle Accidents and Property Damage"
Occurrence reporting	Section 18C , "Occurrence Reporting"
Health services and returning to work	Chapter 16 , "Health, Benefits and Employee Services"
Emergency Preparedness	Chapter 15 , "Emergency Preparedness and Management"

*REFERENCES

*Requirements Source Documents

DoD, [Air Force Instruction 31-204](#), *Air Force Motor Vehicle Traffic Supervision*.

[AFI 31-204, KAFB Supplement 1, 28 February 2005](#)

DoD, [Air Force Instruction 91-207](#), *The US Air Force Traffic Safety Program*, Secretary

of the Air Force.

[CPR400.3.16, Cellular Phones](#)

[KAFB Skating Policy](#)

Implementing Documents

 SNL, *SNL Traffic Safety Rules*.

Quick Reference Traffic Guide for Sandia National Laboratories New Mexico

CPR400.3.11, *Access Controls*, [Attachment B](#), "Parking Rules and Contacts."

Related Documents

[California Vehicle Code](#), General Provisions and Divisions Chapters 1-18.

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ES&H Manual

*SECTION 6G – LASERS AND INTENSE LIGHT

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 - [6G-1](#) – Deputy Laser Safety Officer (DLSO) by Organization
 - [6G-2](#) – Site-Specific Training Completion Record (LAS200SPEC)
 - [6G-3](#) – Laser Safety Self-Assessment Checklist



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to activities involving [lasers](#) at [Sandia-controlled premises](#). It does **not** apply to the normal and intended use of Class 1 laser products (e.g., CD ROM drives, DVD players, laser printers).

TRAINING

Work Activity or Role	Required	Recommended
Qualified Laser Operators	LAS202 – Fundamentals of Laser Safety <ul style="list-style-type: none"> • Refresher required every 3 years. 	N/A
Laser Managers Incidental Laser Personnel	LAS202A – Awareness and Fundamentals of Laser Safety <ul style="list-style-type: none"> • No refresher required. 	LAS202A Members of the Workforce involved with Class 2, or 3a laser operations.
Laser Safety Officers (LSOs) Deputy Laser Safety Officers (DLSOs)	LAS200B – Laser Safety Officer Training <ul style="list-style-type: none"> • Refresher required every 3 years. 	Qualified Laser Operators (at Manager's discretion).

Qualified Laser Operators

LAS200SPEC – Site-Specific Training for Qualified Laser Operators

N/A

- Refresher required if a new hazard is anticipated (e.g., new laser, significant change in operations, increased scope of duties).



AUTHORIZATION OF LASER USERS

Requirements

Qualified Laser Operators shall obtain a baseline laser eye examination performed by an ophthalmologist. Incidental Laser Personnel shall have an eye exam for visual acuity which may be performed by SNL Medical.

Laser Managers shall ensure that Qualified Laser Operators and Incidental Laser Personnel complete all required training, including site-specific training, before authorizing them to work independently. Until this authorization is completed and documented, these persons shall only work under the direct supervision of Qualified Laser Operators. Laser Managers shall evaluate the individuals within their organizations who mentor or otherwise oversee students.

During each Qualified Laser Operator's site-specific training, the operator shall be assigned an Authorization Level that is commensurate with the scope of the operator's duties. The Authorization Level is approved by the Laser Manager. Authorization Levels are defined below.

Authorization Levels:

1. Operation only, **not** authorized to perform alignment or maintenance procedures.

2. Operation and alignment, **not** authorized to perform maintenance procedures.
3. Fully authorized to operate and perform all alignment and maintenance procedures including troubleshooting (**not** intended to include the service and repair activities typically performed by the vendor or manufacturer).

[Laser Managers](#) shall ensure that site-specific training addresses both beam and non-beam hazards and shall include the following core elements:

- Review of Operating Procedure.
- Site-specific posting and labeling requirements.
- Hazard analysis and control measures.
- Site-specific engineering and administrative controls.
- Stopping or pausing work when conditions change or are uncertain.
- Emergency shutdown procedures.
- Guidance on aligning and adjusting laser equipment (if applicable).
- Hands-on training for the performance of alignment procedures (if applicable).
- **Mandatory use of protective laser eyewear, emphasizing that lasers shall not be operated unless appropriate eye protection is worn by all persons who could potentially be exposed to a hazardous beam or its reflections.**

Note: In addition to the above, the responsible manager may require other training. Examples of additional training include, but are **not** limited to:

- Electrical Safety.
- Lockout/tagout (LOTO) procedures.
- Chemical Safety.
- Gas cylinder handling.

Laser Managers shall ensure that upon completion of site-specific training, the [LAS200SPEC Site-Specific Training Completion Record](#) is signed by the trainee, the trainer (if a manager designee), and the responsible Laser Manager. The signed form indicates:

- The trainee has received a baseline laser eye examination.
- The trainee has completed formal and site-specific laser safety training.
- The trainee is authorized by the manager (at the assigned Authorization Level) to work independently with the specified laser system(s).

Note: Refresher training (update to the operator's LAS200SPEC form) is required if a new laser related hazard is anticipated (e.g., new laser, significant change in operations, increased scope of work or authorization level).

The Laser Manager shall ensure that upon completion of LAS200SPEC Site-Specific Training, the appropriate completion date is entered into TEDS by the organization's training coordinator. The completed forms, which include proper approval signatures, shall be retained within the organization's records and updated as necessary (e.g., when refresher training occurs). The TEDS completion date shall also be updated as necessary if a site-specific refresher training occurs.

Guidance

At SNL/NM, Members of the Workforce should contact the Industrial Hygiene Records Administrator at 844-0469 to schedule a laser eye examination. At SNL/CA, Members of the Workforce should contact the Medical Department at 294-2700.

At SNL/NM, managers of organizations that use Class 3b or 4 [lasers](#) should:

- Designate a [deputy laser safety officer \(DLSO\)](#) for their organization.
- Wherever possible, delegate laser safety management duties defined in this section to the DLSO.
- Notify the site [laser safety officer \(LSO\)](#) of the appointment.



DEPUTY LASER SAFETY OFFICER (DLSO)

The Deputy Laser Safety Officer (DLSO) is responsible for assisting the organization manager in the implementation of the SNL Laser Safety Program within their organization (see [Attachment 6G-1, "Deputy Laser Safety Officer \[DLSO\]"](#) for complete list). The responsibilities of the DLSO are divided into administrative and technical responsibilities. All DLSOs are responsible for the administrative responsibilities. The technical role of individual DLSOs is determined by the responsible manager, who will notify the DLSO of their appointment and level of responsibility.

Administrative Responsibilities

- Ensure that all [Members of the Workforce](#) who work with or near Class 3b or 4 laser systems have the appropriate training and have received a baseline laser eye examination.
- Review and ensure that all required work control documents (e.g., TWDs, SOPs, OPs) meet applicable requirements and are updated as required.
- Ensure that a safety review is conducted prior to the operation of a new laser system or an existing laser system that has been significantly modified or moved to a new location.
- Ensure and confirm that the required warning signs are posted and personnel have the required protective laser eyewear prior to the operation of a new laser system or an existing laser system that has been significantly modified or moved to a new location.
- Contact the site Laser Safety Office for assistance when needed.



Technical Responsibilities

- Understand laser system classifications and, if needed, be able to determine laser classification based upon operating parameters.
- Perform hazard analysis calculations to determine Maximum Permissible Exposure (MPE) levels, Nominal Ocular Hazard Distances (NOHDs), Nominal Hazard Zones (NHZs) and the required Optical Densities (ODs) for protective

laser eyewear.

- Determine and document in a work control document (e.g., TWDs, SOPs, OPs) the appropriate engineering and administrative controls (as defined in ANSI Z136.1) and the personal protective equipment required to reduce the risk of personal injury and property damage.



All DLSOs shall complete LAS200B. Additional laser safety training may be taken from other sources and formal Laser Safety Officer Training is recommended for all DLSOs having technical responsibilities.

CONTROL METHODS FOR LASER HAZARDS

Requirements

[Laser Managers](#) shall ensure that:

- All Class 3b and 4 laser operations are covered by an approved [technical work document \(TWD\)](#) or Operating Procedure (OP) that contains, at a minimum, the requirements outlined in this section as well as those in the [Laser Standard Operating Procedure \(SOP\)](#). Appendix A of the SOP provides guidance for preparing a TWD.

Note: TWDs shall be written, reviewed and approved in accordance with [Chapter 21](#), "Technical Work Documents (TWDs)."

- A Hazard Evaluation has been conducted for the laser operations, including the calculation of the [Maximum Permissible Exposure\(MPE\)](#) and [Nominal Hazard Zone \(NHZ\)](#).
- Properly fitting protective eyewear with the appropriate optical density for the specific laser, is available and maintained in good condition for individuals authorized to enter the NHZ.



- Warning signs and labels as specified in ANSI Z136.1, are installed at all entrances to laser [control areas](#) and on laser enclosures, hazard barriers, and fiber optic connections .
- Appropriate engineering or administrative controls, as defined in ANSI Z136.1, are implemented to reduce the risk of injury to individuals entering a laboratory during laser operations. These controls shall prevent the loss of beam control so the hazard zone shall **not** be extended into other areas (e.g., hallways).
- Other appropriate engineering and administrative controls, as defined by either the LSO or the DLSO are used in place and used for all Class 3b and 4 laser operations.
- All newly installed laser interlocks meet National Fire Protection Association (NFPA) 101 requirements.



[Qualified Laser operators](#) shall do the following:

- Ensure that all required safety controls, operating procedures and necessary training are in place and documented prior to operating a laser.
- Ensure that all individuals in the hazard zone are wearing appropriate PPE before operating a laser.
- Accept responsibility for the safety of visitors and observers.
- Instruct visitors and observers on how to protect themselves from the beam and non-beam hazards in the area.
- Answer any hazard or personnel protection questions that visitors or observers may ask.



Guidance

Laser Managers or DLSOs should contact the LSO for information and guidance on the requirements within this section.

INITIAL SAFETY REVIEW AND LASER INVENTORY



Requirements

[Laser Managers](#) and/or [laser](#) owners shall ensure the [laser safety officer \(LSO\)](#) or DLSO has conducted a safety review:

- For any new Class 3b or Class 4 laser prior to operation.
- Whenever a Class 3b or 4 laser is significantly modified or moved to a new room that may require different control methods (see "[Control Methods for Laser Hazards](#)" for more information).

Laser Managers, laser owners, or their designated DLSO shall ensure that all Class 3b and 4 lasers systems (including embedded Class 1 systems) are registered in the corporate laser inventory, assist the LSO in conducting Annual Laser Safety Audits on these systems, and correct any deficiencies noted in these audits. Annual Laser Safety Audits include:

- Laser inventory verification.
- Inspection for required engineering and administrative controls.
- Adequacy and condition of eyewear, signage, and other protective equipment.
- Verification of baseline eye exams.
- Training records review.
- Technical Work Document review.



Guidance

The [Laser Safety Self-Assessment Checklist](#) contains specific guidelines for use during line management self-assessments. Use of this checklist during management self-assessments will help ensure that active oversight of laser operations occurs and is properly documented. Laser Managers should utilize this checklist to conduct self-

assessments of their laser operations and to evaluate student mentors.

OUTDOOR LASER USE

Requirements

Laser Managers shall ensure that the outdoor use of **any class of laser** is coordinated through the [laser safety officer \(LSO\)](#) to ensure compliance with applicable regulations. This requirement applies if the outdoor use of the laser(s) has the potential for the beam to be directed above the horizon, through navigable airspace, towards airports, landing fields, other aircraft ground operations, or could impact other neighboring operations.

Note: Construction laser surveyors and other low power (Class 1, 2 or 3a) laser activities carried out at ground level and do **not** impact airports or other neighboring facilities do **not** typically require Air Force or FAA notification.

INTENSE LIGHT

Requirements

Managers shall ensure that operations which involve an intense source of light (e.g., ultra-violet, visible, infrared) are evaluated and [Members of the Workforce](#) are protected from hazardous levels of light radiation.

Guidance

Members of the Workforce should contact their [Division ES&H Team](#) or their [laser safety officer \(LSO\)](#) to obtain assistance in the evaluation and control of these hazards.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [lasers](#) include:

Hazard/Activity	Reference
Electrical safety	Section 4B , "Electrical Safety Practices"
Laser dyes and toxic gases	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Lockout tagout (LOTO)	Section 4C , "Lockout/Tagout/(LOTO)"
Personal protective equipment (PPE)	Section 4L , "Personal Protective Equipment (PPE)"
Safety signs and tags	Section 4M , "Signs (Including SWHAS) and Tags"

REFERENCES

Requirements Source Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

[29 CFR 1926](#), *Safety and Health Regulations for Construction*.

American Conference of Governmental Industrial Hygienists (ACGIH), *2005 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, Cincinnati, OH, 2005 or latest edition.

Department of Energy Special Operations Report (SOR): Laser Safety Expectations, SOR 2005-01.

ANSI Z136.1-2000, *American National Standard for Safe Use of Lasers*.

NFPA 70E, *Electrical Safety Requirements for Employee Workplaces*.

Implementing Documents

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

SNL, CPR400.1.1, [GN470037](#), *Administrative Control Procedure*.

SNL, MN471001, *ES&H Manual*, CPR400.1.1, [Chapter 21](#), "Technical Work Documents (TWD)."

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.





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ES&H Manual

CHAPTER 5 – FIRE PROTECTION

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*Indicates a substantive change

- [Applicability](#)
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- Attachments
 - [5-1](#) - SNL/NM Barbecue Grill Authorization Checklist
 - [5-2](#) - Use of Portable Space Heaters (PSH)
- Forms
 - SF 2001-CHO, Continuous, Unattended Hazardous Operation Placard ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this chapter, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This chapter applies to activities performed at all [Sandia-controlled premises](#). Members of the Workforce who work at Sandia-controlled premises other than SNL/NM or SNL/CA shall follow (in addition to the requirements established in this section) state and local fire codes and site regulations, and consult the city or county fire marshall for more information, if necessary.

When working at non-Sandia-controlled premises, the policies and procedures of the host site govern the way ES&H fire protection requirements are implemented.



TRAINING

Work Activity or Role	Required	Recommended
All Members of the Workforce	ESH100^a	N/A
Barbecue grill operations	FRP106	N/A
Hot work operations	FRP106	N/A
Fire watcher	FRP106	N/A
Members of the Workforce who are responsible for the use and operation of fire extinguishers.	FRP106	N/A
Personnel who could reasonably be expected to release halons from equipment into the atmosphere (excluding emergency release).	Training on halon emission reduction. ^b	N/A
<p>^a Covers fire extinguisher awareness.</p> <p>^b Training may be obtained via distributors and service companies of halon system (s). Contact Fire Protection for information.</p>		

BARBECUE GRILLS

Requirements

Managers shall be responsible for ensuring that:

- A hot work permit is obtained (consult the [hot work permit contact](#)) prior to engaging in the use of barbecue grills.

Note: At SNL/NM only, in lieu of a hot work permit, managers may act as the responsible party and use the “SNL/NM Barbecue Grill Authorization Checklist.” (See [Attachment 5-1](#), “SNL/NM Barbecue Grill Authorization

Checklist.”)

- The requirements on the attached “[SNL/NM Barbecue Grill Authorization Checklist](#)” are followed when it is used in lieu of a hot work permit.
- The hot work permit or “SNL/NM Barbecue Grill Authorization Checklist” is kept near the grill site.

Note: At SNL/NM, fixed charcoal grill sites are located at the Coronado Club and on KAFB. Hot oil cookers or turkey fryers are not authorized because of the fire danger and potential for injury associated with cooking oil.

Members of the Workforce who operate barbecue grills shall:

- Obtain approval from [Fire Protection](#) Engineering or their managers prior to using a barbecue grill.

Note: At SNL/CA, a hotwork permit is necessary prior to operating a barbecue grill.

- At SNL/NM, follow the requirements listed on the hot work permit or the “SNL/NM Barbecue Grill Authorization Checklist.”

COMMON AREAS, AISLES, AND CORRIDORS

Requirements

Managers shall be responsible for ensuring that:

- [Exit ways](#) are kept clear of all obstructions or impediments.
- Exit ways are not used to store ordinary combustible material (e.g., paper, cardboard, or other wood products) unless they are stored in steel cabinets.
- Hazardous material (including flammable liquid) is **not** stored in exit ways.

- Equipment, cabinets, or material of any kind are not placed in stair enclosures.
- Storage cabinets located in exit ways are:
 - Constructed of steel.
 - Equipped with swinging steel doors or retractable steel covers that are to be kept closed when the cabinets are not in use.
 - Placed in a manner that does not obstruct or reduce the required width of any exit way.
- Furniture or other obstructions are not placed within the required width of exit ways or where they could obstruct the view of or access to exit signs, fire alarm strobe lights, manual fire alarm pull stations, or fire extinguishers.



Guidance

Managers should:

- Obtain approval from the [fire protection contact](#), the appropriate [Division ES&H Team](#), or the appropriate [building manager](#) before:
 - Placing a photocopy or vending machine in exit ways.
 - Placing cabinets or other storage items in corridors, lobbies, and other common areas of a building.
- Ensure storage cabinets located in exit ways:
 - Meet seismic anchoring requirements (at SNL/CA only).
 - Are placed on only one side of a corridor and in a manner that does not obstruct or reduce the required width of any exit way.
 - Are labeled with placards containing the following information:
 - Organization number of the owning organization
 - Responsible person's name and telephone number





- General description of contents (e.g., office supplies)
 - Approval from the appropriate Division ES&H Team or the building manager
- Ensure aisles and corridors in the workplace adhere to the following widths (consult the appropriate fire protection contact for specific egress widths):

Number of Occupants	Area Description (Examples)	Minimum Width (Inches) of Exit ways
1 to 2	Single office or cubicle	28
3 to 9	Office area, lab, or shop	36
10 to 49	Office area, lab area, or shop with clearance between desks and partitions	36
50 to 199	Office area, lab, or shop	44
200 or more	Office area, lab, or shop	66



AUDITORIUMS AND CONFERENCE ROOMS

Requirements

Members of the Workforce shall **not** stand or sit in aisles or block [exit ways](#) of auditoriums or conference rooms.

Guidance

Meeting organizers should:

- Be aware of meeting-room occupancy loads when scheduling meetings.
- Inform meeting attendees of exit locations.

RESTRICTIONS FOR USING VEHICLES AND MOTORIZED EQUIPMENT

Requirements

Members of the Workforce shall follow restrictions for using [vehicles](#) and [motorized equipment](#) in [Section 4K](#), "Traffic Safety."

RESTRICTIONS FOR PARKING BICYCLES

Requirements

Members of the Workforce shall adhere to restrictions for parking bicycles in [Section 4K](#), "Traffic Safety."

*PERMITS

*Requirements

Members of the Workforce shall consult the [fire protection](#) contact to obtain a permit before conducting [hot work](#) activities (see [Section 4E](#), "Hot Work Safety").

Welding, Cutting (Thermal) and Brazing Control (WCBC) Permits

Managers who are responsible for welding, thermal cutting, and brazing activities shall ensure that Members of the Workforce contact the Industrial Hygienist on the [Division ES&H Customer Support Team](#) to obtain a Welding, Cutting, and Brazing Control (WCBC) Permit prior to obtaining a Hotwork Permit. A Hotwork Permit will not be issued until a WCBC Permit has been obtained from Industrial Hygiene.

Implementation of interim control measures (e.g., full face air-purifying respirators, local

exhaust ventilation) may be required until effective, documented, work controls and/or conditions are approved.

Note: A Hotwork Permit will be granted only if a WCBC Permit has been obtained AND the requester's training is current.

SPRINKLER SYSTEMS

Requirements

Managers shall be responsible for ensuring that bookshelves and storage items do **not** come within 18 inches of sprinkler heads to prevent obstruction of the spray discharge pattern.

Members of the Workforce shall **not**:

- Obstruct the water spray pattern from sprinklers or otherwise impair the operation of the sprinkler system.

Note: Missing ceiling tiles can degrade activation of sprinkler systems. Consult the [facilities support](#) contact for replacement of ceiling tiles.

- Use sprinkler systems to hang, support, brace, or pry any equipment or any other nearby item.

- Tamper with any part of a [fire suppression system](#).

Guidance

Members of the Workforce should:

- Consult the [facilities support](#) contact if the temperature in their work area is suspected to be below 40° F.
- Inform the [fire protection](#) contact if any building or room with a sprinkler system may be subject to a loss of adequate heating during the cold season.



*FIRE BARRIERS

*Requirements

Members of the Workforce shall:

- **Not** modify existing fire doors (e.g. installing door louvers, vision windows, cutting doors or drilling holes).
- **Not** block open fire doors or in any way prevent fire doors or fire windows from operating as designed.
- **Note:** Fire doors are identified by a label affixed to the **edge** of the door or by a sign placed on the door by fire protection or the building manager.
- **Not** install door stops on fire doors.



Members of the Workforce performing construction type activities that penetrate fire barriers shall:

- Firestop all **penetrations** through fire barriers as detailed in Sandia Construction Standard Specification Section 07270, Firestop and Smokestop Systems and the International Building Code, Chapter 7 Fire-Resistance-Rated Construction, Section 712, "Penetrations," and Section 713, "Fire-Resistant Joint Systems."
- Smokestop all **penetrations** through smoke barriers as detailed in Sandia Construction Standard Specification Section 07270, Firestop and Smokestop Systems and the International Building Code, Chapter 7 Fire-Resistance-Rated Construction, Section 712, "Penetrations," and Section 713, "Fire-Resistant Joint Systems."
 - **Penetrations** include but are not limited to: voids around pipes, ducts, conduits, cable trays; joints between fire barriers and other construction; other joints and openings.
- Remove fire doors that are no longer in use and fill resulting door openings with



approved fire rated construction and firestopping.

WASTE CONTAINERS

Requirements

Members of the Workforce shall consult the [fire protection](#) contact:

- For recommended fire-suppressing containers that meet fire code and security "burn bag" requirements.
- Before making any changes in the type or use of fire-suppressing waste containers.

Note: Fire-suppressing waste containers are **not** authorized for hazardous waste disposal (see [Section 19A](#), "Hazardous Waste Management").

Guidance

Members of the Workforce should:

- Obtain fire-suppressing waste containers from Just-In-Time (JIT) for use in computer centers and records storage areas.
- Ensure that fire-suppressing waste containers obtained from other sources are Factory Mutual (FM) or Underwriter's Laboratory[®] (UL)-listed.

FIRES AND FIRE ALARMS

Requirements

Members of the Workforce shall:

- Refrain from fighting fires, unless doing so does **not** present undue risk and the fire is in the beginning stages and does **not** involve radioactive, highly toxic, or other unusually hazardous material.
 - **Not** attempt to fight any type of fire within a confined space.
 - Follow fire alarm procedures in [Chapter 15](#), "Emergency Preparedness and Management."
 - **Not** tamper with [fire alarm systems](#).
-

BUILDING EVACUATION INFORMATION

Requirements

Members of the Workforce who are members of a building evacuation team shall follow requirements in Chapter 15, "Emergency Preparedness and Management," [Attachment 15-3](#).

Guidance

For information regarding Fire Safety Floor Plans, Members of the Workforce should see the *International Fire Code, 2006 Edition*, "[Fire Protection Guidance](#)."

FIRE EXTINGUISHERS

Requirements

Managers shall be responsible for ensuring that the following types of government-owned vehicles assigned to their organization are equipped with 10-pound minimum or 10A:60BC fire extinguishers (secured with brackets):

- Vehicles that transport explosives, including forklifts

- Instrumentation trailer vans with high-value contents or that are vital to an SNL program
- Vehicles that transport significant quantities of [flammable liquids](#) (e.g., tank trucks)
- Vehicles and trailers installed with welding equipment
- Vehicles and trailers containing transportable generators
- Ambulances

Members of the Workforce shall:

- Operate fire extinguishers according to instructions presented in [ESH100](#) (see "[TRAINING](#)" for more information).
- Report damaged, blocked, or discharged fire extinguishers to [Telecon Plus](#) at SNL/NM and [Fire Protection](#) at SNL/CA.
- Use fire extinguishers for intended purposes only (e.g., do **not** use as door stops).

[Space/equipment owners](#) shall ensure fire extinguishers in their organization (including vehicles):

- Are properly installed (consult the [facilities support](#) contact for assistance).
- Are inspected monthly.

Guidance

Inspectors of fire extinguishers should:

- Read the inspection checklist on the back of the monthly fire extinguisher inspection tag before fire extinguisher inspections are conducted.
- Consult the [fire protection](#) contact to obtain a new fire extinguisher or to report the discharge of a fire extinguisher.

Managers should ensure government vehicles (e.g., GSA vehicles, E-Z GO carts) used primarily at remote sites are equipped with 10 pound minimum or 10A:60B:C fire extinguishers (secured with brackets).

FURNITURE AND EQUIPMENT

Requirements

Managers at SNL/CA shall be responsible for ensuring that furniture and equipment over 4 feet in height are secured to preclude blocked exits during seismic events unless otherwise approved by their [Division ES&H Team](#).

Guidance

Managers should:

- Ensure all custom-made partitions, bookcases, shelving, and furniture are constructed of noncombustible material unless otherwise approved by the [fire protection](#) contact.
- Consult the [fire protection](#) contact for information on approved material for furniture.

OFFICE DISPLAYS AND DECORATIONS

Requirements

Managers shall ensure:

- Office displays (e.g., signs on tripods) and wall coverings (e.g., acoustical material, curtains, drapes):
 - Meet minimum fire-retardancy standards (consult the [fire protection](#) contact

for assistance).

- Do **not** reduce exit clearance below the required minimum widths.
- Do **not** obstruct exits and exit signs, fire extinguishers, and manual fire alarm stations.

- Office decorations:

- Are made of only flame-resistant material

Note: Small, metal or flame-resistant plastic Christmas trees are permitted, as well as glass, metal, and small plastic tree ornaments.

- Are located away from heating equipment or heat-producing lights and arranged in a manner that would **not** contribute to the spread of a fire.
- Include only Underwriter's Laboratories® (UL)-listed micro-miniature light sets and lighted decorations that are in good condition and that are constantly attended while in use.
- Use extension cords that are UL-listed temporary power taps containing pilot lights and built-in circuit breakers.
- Do **not** exceed light manufacturers' recommendations for the number of light sets.
- Do **not** include combustible material (e.g., foamed plastic, tumbleweeds, natural trees not approved by the [fire protection](#) contact).
- Do **not** use candles or other open-flame decorations.
- Do **not** obstruct egress routes.
- Do **not** include lights on metal trees.

PREPARATION FOR HOLIDAY SHUTDOWNS

Requirements

Members of the Workforce shall unplug the following types of equipment, tools, and appliances before leaving for holiday shutdowns:

- Tools, such as soldering irons, test equipment, and bench-top equipment
- Coffee pots, hot plates, and portable heaters

Note: Members of the Workforce may leave equipment connected if unplugging it will damage expensive batteries (e.g., two-way radio batteries) or if they are designed to be continuously plugged into a 120-volt receptacle (e.g., chargers for calculator batteries, two-way radio batteries, cellular phone batteries) and the area is kept clear of paper and other combustibles.

Guidance

Members of the Workforce should unplug office equipment, such as personal computers, printers, plug-in strips, calculators, and small battery chargers, before leaving for holiday shutdowns.

OPERATION OF HEAT-PRODUCING APPLIANCES

Requirements

Members of the Workforce shall:

- Ensure all portable electrical appliances (e.g., coffee pots, hot plates) and appliances having open-flames or exposed elements that are used in the workplace are Factory Mutual (FM)-approved or Underwriter's Laboratory® (UL)-listed and used in accordance with instructions included in the listing or labeling.
- Ensure that personal coffee makers, hot plates, hot pots, etc. are either equipped with an automatic shut-off device (no timers) or an occupancy-controlled power strip.

Note: For energy conservation and safety, an approved occupancy-controlled power strip can be obtained through JIT (BSN IDP-3050, eight-outlet power strip with Auto-ON personal sensor, 8-ft. cord). The occupancy-controlled power strip must be rated for the intended load (i.e., one that will accommodate the coffee maker, hot plate, or hot pot, as well as any other devices that will be connected to the same unit).

- Keep heat-producing electrical appliances on noncombustible surfaces or on a noncombustible pad or plate only (e.g., an insulated metal or Pyrex plate).
- Place hot soldering irons in approved holders between uses and keep them there until they cool to room temperature.
- Take the following action before purchasing or bringing in a portable space heater (PSH):

Step	Action
1	Contact Telecon Plus (at SNL/CA, contact Maintenance Trouble Line) to determine if the uncomfortable temperature can be remedied by adjusting the heating, ventilation, and air-conditioning (HVAC) system. Note: Facilities personnel shall attempt to correct the operation of the HVAC system and shall check the electrical system to verify the system can handle the additional load.
2	<p>If Facilities finds that the electrical system can handle the additional load, contact the building manager (at SNL/CA, contact Fire Protection) for authorization to purchase or bring in a PSH that meets the following criteria for approved portable space heaters:</p> <ul style="list-style-type: none"> ○ Underwriter's Laboratory (UL) or a Factory Mutual (FM) listing. ○ A broad base to avoid easy tip-over. ○ A thermal, overheat-protection device. ○ Sealed, liquid-filled radiators (hydronic type - no wires or elements).



3	Obtain an occupancy-controlled power strip that is rated for the intended load (i.e., one that will accommodate the PSH as well as any other devices that will be connected to the same unit).
4	Before using a PSH for the first time, consult the fire protection contact to request inspection of the area in which the PSH will be used. Note: At the discretion of the requester, the work-place inspection may occur before purchasing or bringing in a PSH.
5	Follow the requirements in Attachment 5-2 regarding the use of portable space heaters.

Guidance

Members of the Workforce should:

- Keep appliances that are warm from use at least 18 inches away from combustibles, such as wood furniture, combustible walls, or paper.
- Follow manufacturers' recommendations for safe operations.
- Turn off or unplug appliances when they are not in use and at the end of the workday.
- Replace personal coffee makers with one large coffee maker located in a common area, for energy conservation and fire safety purposes.
- Plug large coffee brewers (usually located in conference rooms or common areas) into an [occupancy-controlled power strip](#) to mitigate fire safety concerns related to burners that are left on for extended periods of time.
- Refer to [Fire Protection Guidance](#) for Sterno® use.



Note: The intrinsic thermal shut-off device cuts power to the water heater within the unit only. It does not cut power to the burners.

SMOKING

Requirements

Members of the Workforce who smoke shall:

- Smoke outside buildings where it does **not** create a hazard (e.g., away from flammable gas and [flammable liquid](#) containers, away from loading docks, away from freight elevators).
- Not smoke on roofs or balconies.

Guidance

Members of the Workforce should:

- Deposit ashes from smoking material in dedicated ash receptacles whenever possible.
- Use steel containers or ashtrays with foot levers (e.g., step-to-open containers) marked "For cigarette butts only" as outdoor containers.
- Be aware of the danger of wild-land fires when smoking outdoors.

STORAGE OF FLAMMABLE AND COMBUSTIBLE MATERIAL

Requirements

Members of the Workforce shall:

- **Not** accumulate large amounts of combustibles, such as waste paper or corrugated cardboard boxes inside buildings.

Note: Members of the Workforce may collect combustibles for recycling **if** boxes are removed on a regular basis and do **not** violate required egress widths (see "[Common Areas, Aisles, And Corridors](#)" for more information).

- Store used rags in approved, self-closing metal cans, separate from clean rags. (Used rags that are soaked with flammable or combustible liquids can spontaneously combust.)
- Dispose of rags according to SNL waste disposal requirements in [Section 19A](#), "Hazardous Waste Management."
- Store common office quantities (i.e., no more than one liter) of correction fluid (e.g., Liquid Paper™), rubber cement, glass cleaners, and similar material in desk drawers or cabinets.
- Store aerosol cans containing flammable substances (e.g., spray paint, spray lubricant) while not in use in an FM-approved or UL-listed [flammable liquids](#) storage cabinet.
- Store flammable liquids overnight in cabinets designed for flammable liquid storage cabinets or flammable materials refrigerators rather than fume hoods. Some flammables may be used and stored in a hood when a large container is part of a dispensing station.
- **Never** use or store [Class 1 flammable liquids](#) in basements.

Guidance

Members of the Workforce should:

- Consult the appropriate [Division ES&H Team](#) or the [fire protection](#) contact for questions about storage and use of the following:
 - Flammable liquids in excess of common office quantities
 - [Compressed gases](#)
 - Flammable solids
 - Incompatible or reactive material
 - Liquid-phase propane or butane

- Follow these guidelines for maintaining proper clearances between stored material and ignition sources and sprinkler systems:
 - Do **not** store material within 18 inches of ignition sources (e.g., lights other than fluorescent lights, hot pipes).
 - In areas that do **not** have sprinklers, maintain 24 inches of clearance between the ceiling and stored items. If stored items are against a wall, items may be stored to the ceiling if there is no likelihood that items could fall from vibration or other local conditions.
- Practice good housekeeping in their offices to prevent the accumulation of paper products.
- Not place flammable liquid storage cabinets in basements or below grade locations.

PROCESS - OR OPERATION-SPECIFIC FIRE HAZARDS

Guidance

Members of the Workforce should:

- Consult the [fire protection](#) contact for information on process- or operation-specific fire hazards.
- Be aware that the following are examples of processes and operations that pose special fire hazards:
 - Spray finishing
 - Work where flammable vapors are present within the explosive range of a chemical, as described in [material safety data sheets \(MSDSs\)](#), and may require explosion-proof and nonsparking equipment

- Processes or operations that produce combustible metal dust



- SNL personnel should **not** use vacuum cleaners to clean up combustible metal dust particles.

CONTINUOUS, UNATTENDED HAZARDOUS TESTS OR OPERATIONS

Guidance

Managers should ensure that a continuous, unattended hazardous operation placard (SF 2001-CHO [[Word file](#)/[Acrobat file](#)]) is installed for all unattended tests or operations posing a fire, explosion, water leakage, or smoke hazard.

Members of the Workforce should:

- Install a [continuous, unattended hazardous operation](#) placard on, or as near as practical to, the unattended equipment to alert security police officers and others that unattended equipment is being deliberately operated.
- Turn placards over to display "Not in Use" when operations are shut down.
- Consider the following items when developing a [technical work document](#) (see [Chapter 21](#), *Technical Work Documents (TWDs)*), or operator aid for [continuous, unattended hazardous operations](#):

Type of Hazardous Operation	Items to Consider



Electrical

- Electrical wiring
- Grounding and bonding
- Emergency shutoff switch
- Fuses or circuit breakers



Mechanical

- Solid construction
- Proper hoses and fittings
- Spill containment (adequate for spills and leaks) (see [Section 10E](#), "Chemical Spills")
- Pressure safety (see [MN471000](#), *Pressure Safety Manual*, for more information)



Flammability

- Minimum of combustibles
- [Flammable liquids](#) and gases
- Explosive vapors and fumes
- Adequate ventilation

Safety

- Warning signs
- Safety shields (e.g., machine guards, barricades)
- Static grounding
- Explosives



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to fire protection include:

Hazard/Activity	Reference
Activities involving hot work	Section 4E , "Hot Work Safety"
Operations involving oil, grease, or fuel	Section 10F , "Oil and Fuel Storage"
Explosives activities	Chapter 9 , "Explosives Safety"
Selection and assembly of pressure hardware	Section 4D , Pressure Safety Operations
Project safety plan for new construction	Section 1B , "What Is the Scope"
Office safety	Chapter 3 , "Office Safety"
Retirement of ozone-depleting substances used in fire protection	Section 17D , "Ozone-Depleting Substances (ODSs)"
Overnight storage of gasoline- or diesel-powered forklifts in buildings	Section 4J , "Material Handling - Cranes, Hoists, and Forklifts"
Electrical safety	Section 4B , "Electrical Safety Practices"



REFERENCES

Requirements Source Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

[29 CFR 1910.156\(b\)](#), *Fire Brigades: Organization*.

[29 CFR 1910.157](#), *Portable Fire Extinguishers*.

[29 CFR 1910, Subpart Q](#), *Welding, Cutting, and Brazing*.

[40 CFR 82, Subpart H](#), *Halon Emissions Reduction*.

[DOE 420.1B](#), *Facility Safety*.

[DOE 430.2A](#), *Department Energy and Utilities Management*.

[DOE 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

International Code Council, *International Building Code*.

International Code Council, *International Fire Code*.

DoD, [Air Force Instruction 31-204](#), *Air Force Motor Vehicle Traffic Supervision*.

NFPA 1, *Fire Prevention Code*.

NFPA 10, *Standard for Portable Fire Extinguishers*.

NFPA 13, *Standard for the Installation of Sprinkler Systems*.

NFPA 70E, *Electrical Safety Requirements for Employee Work Places*.

NFPA 75, *Standard for the Protection of Electronic Computer/Data Processing*

Equipment.

NFPA 101, *Life Safety Code.*

Related Documents

[28 CFR 36](#), *Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities.*

[29 CFR 1926](#), *Safety and Health Regulations for Construction.*

[40 CFR 261](#), *Identification and Listing of Hazardous Waste.*

[36 CFR 1190](#), *Minimum Guidelines and Requirements for Accessible Design.*

[DOE M 440.1-1](#), *DOE Explosives Safety Manual.*

FM Global, *Property Loss Prevention Data Sheets*, Johnston, RI.

NFPA 1, National Fire Protection Association.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection.*

NFPA 45, *Fire Protection for Laboratories Using Chemicals.*

NFPA 69, *Standard on Explosion Prevention Systems.*

NFPA 70, *National Electrical Code.*

NFPA 72, *National Fire Alarm Code.*

NFPA 88A, *Standard for Parking Structures.*

NFPA 88B, *Standard for Repair Garages.*

NFPA 230, *Standard for the Fire Protection of Storage.*

NFPA 231D, *Standard for Storage of Rubber Tires.*

NFPA 232, *Standard for the Protection of Records.*

NFPA 600, *Standard on Industrial Fire Brigades.*

NFPA 1901, *Standard for Automotive Fire Apparatus.*



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ES&H Manual

***SECTION 4V – ES&H FOR CONTRACTED CONSTRUCTION AND CONSTRUCTION-LIKE ACTIVITIES**

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MN471001, Issue E

Revision Date: [May 8, 2007](#); Replaces Document Dated: December 15, 2006

Review Date: April 25, 2007



* Indicates a substantive change

- [Applicability](#)
 - [Managing Contractor-Directed Contracts](#)
 - [Project Safety and Health Plan](#)
 - [Permits](#)
 - [Routine Inspections](#)
 - [Emergencies, Accidents, and Injuries](#)
 - [Leased Equipment for Construction-Like Work](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [4V-1](#) - ISMS Considerations for Project Safety and Health Plans
 - [4V-2](#) - Performing Work-Site Inspections
 - [4V-3](#) - Activity Hazard Analysis (AHA) For Construction Instructions
 - [4V-4](#) - Activity Hazard Analysis (AHA) For Construction Template
-



APPLICABILITY

For purposes of this document, [Members of the Workforce \(MOW\)](#) are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This Section applies to [MOW](#) who procure and manage [construction-like activities](#) on [Sandia-controlled premises](#) that are acquired from [contractors](#) or suppliers. It also provides guidance to Managers who direct construction-like activities involving MOW.

MANAGING CONTRACTOR-DIRECTED CONTRACTS

For all contracted construction or construction-like activities, the following responsibilities apply to the Managers of line organizations and Sandia Delegated Representative (SDR). Requirements are identified in the [SNL Safety Policy for Construction and Construction-Like Activities, January 22, 2006](#).

Note: For the purposes of this document the term, "Manager" refers to the Line Manager of the SDR, or Requester named on the contract or any other Line Manager specifically named in the contract as being responsible and accountable for the implementation of the requirements of this Section.

Requirements

The Managers of line organizations shall be responsible for appointing and documenting in the contract a SDR or designee. Managers of line organizations and SDRs shall use SNL Procurement to place all [contractor-directed contracts](#) for performing [construction and construction-like activities](#) on [Sandia-controlled premises](#).

Contract ES&H Specification Requirements

Managers shall be responsible for developing an ES&H Specification (which will be included in the contract) that requires the contractor to do the following:

- Develop a Safety and Health and Safety Plan that includes the following elements:
 - Drawings and/or other documentation of protective measures for which OSHA standards require preparation by a registered professional engineer or a competent person as required by OSHA.
 - Sandia site-specific requirements.
 - A requirement to comply with all OSHA 29 CFR 1926 construction and 29 CFR 1910 general industry regulations as appropriate and Sandia site-specific requirements.
 - A provision which allows the worker's right to stop work (i.e., **not** perform work they believe to be immediately dangerous to their life and health or the life and health of another until the concern is satisfactorily addressed).
 - A list of project activities for which an Activity Hazard Analysis (AHA) will be performed (e.g., excavation, foundations, structural steel erection, electrical work, concrete forming and pouring).
 - Flow down provisions to assure all requirements of the ES&H specification apply to all subcontractors working on-site.
 - A provision which specifies that workers will be subject to disciplinary action from the contractor's company for failure to comply with safety rules and protective/control measures.
- Activity Hazard Analysis (AHA) preparation and associated requirements include:
 - An AHA shall be prepared and submitted to the SDR or designee for each separately definable construction activity. The AHA may be submitted separately from the Project Safety and Health Plan.
 - The AHA shall be approved by the SDR or designee before the initiation of on-site work addressed by the AHA.
 - Each AHA shall identify foreseeable hazards and planned protective measures.
 - The AHA shall list the steps in each activity, the hazards of each step, and



the controls to eliminate or mitigate the hazards of each step.

- Workers shall be briefed on each relevant AHA prior to beginning work so workers are aware of foreseeable hazards and protective measures.
- The AHA shall be revised and approved if further hazards are revealed by supplemental site information or other input from workers and supervisors.
- Workers shall be briefed after an AHA is revised to reflect new or increased hazards and/or additional control measures.
- The AHA shall include a requirement which states the prime contractor will train their workers and ensure subcontractor workers are trained.
- The AHA shall identify the contractor personnel (e.g., superintendent, field supervisor, designated safety representative [s]) who are responsible for implementing the Project Safety and Health Plan including their duties and qualifications. This includes:
 - A requirement to conduct daily inspections of the work-site.
 - A provision allowing authority to act for the contractor.
- The AHA shall require a designated safety representative for contractor-directed contracts to be on-site at all times when work activities being performed to:
 - Help implement the Project Safety and Health Plan.
 - Take necessary corrective actions to mitigate hazards.

Note: Guidance on potential concerns to be addressed can be found in [Attachment 4V-2](#), "Performing Work-Site Inspections." For small-scale construction-like activities that involve routine work tasks and customary hazard controls (i.e., controls which do **not** require preparation by a safety engineer or safety-related expert), a generic Activity Hazard Analysis (AHA) may be prepared. The level of detail of the Plan should be appropriate for the size, complexity, and risk level of the construction project (see [4V-3](#) – "Activity Hazard Analysis (AHA) for Construction Instructions" and [4V-4](#) – "Activity Hazard Analysis (AHA) for Construction Template").



- Satisfy ES&H training requirements and responsibilities that are associated with

the contracted work (see [Contractor Training Instructional Aid](#) and [Chapter 11](#), "ES&H Training") are satisfied.

- The requirement that personnel shall possess the appropriate technical competence to comply with the requirements defined within this Section.
- Communication of schedules and anticipated hazards related to construction and construction-like activities to affected [Members of the Workforce \(MOW\)](#) and neighboring worksites where potential hazard exposure may exist by performing the work activities.
- Ensure that activities have been reviewed for NEPA determination in accordance with the following Sections and that any determination guidance, restrictions, or conditions are included in the appropriate specifications, [technical work documents \(TWDs\)](#), Project Safety and Health Plans, and SOWs in accordance with "National Environmental Policy Act (NEPA), Cultural Resources and Historic Properties" and [Section 10C](#), "Migratory Birds, Protected Species, and Other Biota."
- At SNL/CA the SDR or designee shall:
 - Communicate requirements for construction and maintenance service contracts managed by [Facility Operations at SNL/CA site \(FOCAS\)](#) to contractors through the use of SNL Standard Specification, Section 01860 or SNL Standard Specification, Section 01065S.
 - Formally present all proposed construction projects or construction-like activities to the ES&H Interdisciplinary Team (IDT) for review, regardless of whether or **not** the work is managed by Facilities Operations.


The SDR or designee shall do the following:

- Be familiar with the SOW and request for quotation (RFQ) for the contracted work activity to be performed.
- Review specified documentation submittals (e.g., Project Safety and Health Plan, Activity Hazard Analysis (AHA), contractor training records, product literature, shop drawings, test data).
- Perform the following before onsite work begins, and prior to initiating work outside the scope of the original task:

- 
- Inform the [Sandia contracting representative](#) (SCR) of acceptance or reason for non-acceptance.
 - Note omissions, inconsistencies, or errors before work begins, and prior to initiating work outside the scope of the original task.
 - Provide submittals that are directly related to ES&H issues to the appropriate [Division ES&H Team](#) for review.
 - Routinely observe contractor performance and review contract work as it is being completed to ensure that it meets the contract requirements, including ES&H requirements.
 - Notify the SCR of contractor performance concerns in a timely manner.
 - Notify the SCR, as soon as it safe to do so, when work has been suspended due to [imminent danger](#), and subsequently when hazards have been appropriately controlled or abated.
- 

Note: Only the SCR can restart the work of a contractor-directed contract. See Section 1D, [Attachment 1D-1](#), "Suspending and Restarting Work."

Note: Additional SDR requirements are described in [CPR500.2.1](#), *Procurement Manual*, [Section 5.2](#), "Sandia-Delegated Representative (SDR): Roles and Responsibilities."

- Consult the appropriate [Division ES&H Team](#) for the following:
 - Consultation on planned contracted construction or construction-like activities.
 - Assistance with ES&H requirements germane to the review of a Project Safety and Health Plan.
 - To obtain qualified reviewers for the Project Safety and Health Plan.
- 

The SDR shall ensure work in radiological or nuclear facilities have the quality significant (Q-sig) contract language and a requirement that the work have an ALARA design study if the work will affect radiological safety. The latter is required by [CPR400.1.32](#), *Radiological Protection Procedures Manual*, [Chapter 7](#).

Note: Assistance in communicating with [Members of the Workforce \(MOW\)](#) who could potentially be exposed to hazards created by the work (i.e., personnel at the work-site and those neighboring work-sites) may also be provided by Building Managers (SNL/NM), Sub-site Managers, and Zone Managers (SNL/CA).



PROJECT SAFETY AND HEALTH PLAN

Requirements

Managers shall ensure a Project Safety and Health Work Plan that addresses all ES&H Specification requirements includes or flows down all requirements to sub-contractors is properly submitted. Managers shall provide a qualified review of the Safety and Health Plan and retain the Plan throughout the duration of projected activities (i.e., conducted on-site).

At a minimum, the Project Safety and Health Plan shall include the following:

- An outline of required and supplemental ES&H training for contractor personnel, which includes a work-site-specific, ES&H orientation.
- Drawings and/or other documentation of protective measures for which OSHA standards require preparation by a professional engineer or other qualified individual. For example, OSHA requires a registered professional engineer to prepare drawings for tube and coupler scaffold over 125 feet high.

Note: See [Attachment 4V-3](#), "Activity Hazard Analysis for Construction Instructions" and [Attachment 4V-4](#), "Activity Hazard Analysis For Construction Template."

- A provision to instruct workers to report hazards **not** previously identified or evaluated to the contractor's designated safety representative. If an immediate corrective action is **not** possible, then the following steps shall be taken:
 - Notify all affected workers.
 - Post appropriate warning signs.



- Take interim measures until permanent abatement actions are implemented.
- Notify the [Sandia delegated representative \(SDR\)](#) or designee.
- A description of the methods that will be used to communicate safety and health information on a regular basis to workers. Methods may include daily pre-task plans, daily tool box meetings, re-briefing all or parts of the AHA or daily completion of a hazard checklist.
- A provision for properly revising and re-submitting the Project Safety and Health Plan to the SDR if any of the following occur:
 - Repeated ES&H performance deficiencies are identified during the project.
 - Changes in operations or personnel which impact project safety management, as determined by the SDR or designee.
 - New activities are introduced that significantly diverge from the original scope of the Project Safety and Health Plan
 - New physical, health, or environmental hazards are introduced to the project that significantly affects worker safety and health.



Managers (i.e., Line Manager of the SDR or Requester named on the contract or any other Line Manager specifically named in the contract) shall be responsible for requiring a documented pre-construction meeting and subsequent meetings for major contract changes to discuss the Project Safety and Health Plan, contract performance expectations, and the effects that the work activity and existing operations will have on each other. At a minimum, participants shall include:

- [Sandia contracting representative](#) (SCR).
- SDR for the requesting organization responsible for the contract.
- [Contractor](#) and subcontractor representatives.
- [Division ES&H Team](#) representatives.

The SDR shall perform one of the following before work begins and prior to initiating major changes required during the project:

- Note deficiencies, omissions, or errors with the Project Safety and Health Plan.



- Notify Contractor of deficiencies, omissions, or errors and request Contractor re-submittal of Project Safety and Health Plan.
- Review and approve the Project Safety and Health Plan.

Guidance

SDR should refer to [Attachment 4V-1](#), "ISMS Considerations for Project Safety and Health Plans," for guidance.

In addition, the SDR should:

- Consult either or both of the following for assistance with acceptance of the Project Safety and Health Plan:
 - [Construction-like activities](#) contact.
 - Appropriate [Division ES&H Team](#).
- Coordinate with the following, as appropriate:
 - Building and [Division ES&H coordinators](#).
 - [Sub-site managers](#) (SNL/NM) or zone managers (SNL/CA).
 - Sandia organizations affected by the construction contract.
 - Safeguards and security personnel.
- Consider holding a post-construction meeting to provide feedback from Sandia to the contractor.



PERMITS

Requirements

Managers shall be responsible for ensuring that:

- External permit and licensing requirements are followed (e.g., State of New Mexico Construction Industry Division licensing requirements).
- At SNL/CA, a Sandia California facility safety permit and a confined space permit is obtained, as needed.

Additional permit and tag requirements include but may **not** be limited to the following:

- Excavations and penetrations (see [Section 4H](#), "Excavations, Trenches, and Floor or Wall Penetrations").
- At SNL/CA, a Sandia California facility safety permit and a confined space permit, as applicable.
 - Fugitive Dust Control Permit - For surface disturbance activities affecting land area greater than 3/4 acre, sandblasting and other surface preparation, or demolition of any building containing over 75,000 cu. ft. of total area. See [Section 17B](#), "Air Permits."
 - Authority-to-Construct Permit – For potential air emission sources (i.e., boilers, chemicals, generators) see Section 17B, "Air Permits."
 - Storm Water Control - For construction sites greater than one acre, develop and submit a Pollution Prevention Plan to the SDR for review prior to construction activities. Pollution Prevention Plan shall follow EPA 832-R-92-005, which addresses silt control and other possible storm water impacts. At SNL/CA, the contractor shall submit a completed "Storm Water Pollution Prevention Plan and Monitoring Program Checklist" along with a "Storm Water Pollution Prevention Plan."
 - Hot Work activities (see [Section 4E](#) – "Hot Work Safety").
 - Confined Space activities (see [Section 6I](#) – "Confined Space Entry").
 - Sanitary Sewer Discharge - Notify SDR of planned discharges to sanitary sewer system, other than routine sewage, prior to discharge. SDR will review the planned discharge and coordinate authorization from the Sandia Water Quality organization.
 - Underground Storage Tanks (UST) - UST installation and maintenance operations shall comply with New Mexico Environment Department (NMED),

UST Bureau requirements. A NMED UST Bureau-Certified Contractor shall perform work activities on UST's.

- Surface Discharge - A SDR will review planned discharge, and coordinate authorization from Sandia Water Quality organization.
- [Energized Work Permit](#) - Prior to performing work on or near exposed and/or live energized equipment, obtain and submit a Request for Contractor Work On or Near Exposed/Live Energized Equipment.

Guidance

The SDR or designee should consult the appropriate [Division ES&H Team](#) for assistance with permit requirements.

ROUTINE INSPECTIONS

Requirements

[Sandia Delegated Representatives \(SDRs\)](#) are responsible for the following activities:

- Ensuring that work-site inspections (of the contractors performing under contractor-directed contracts) are conducted and include work performance and work progress.
- Maintaining documentation of inspections (e.g., checklists, logs, or memoranda) in project files until project closeout, at a minimum.

Guidance

SDR should do the following:

- Include [Division ES&H Team](#) representatives on work-site inspections to help determine compliance with ES&H requirements.
- Transfer the records to the appropriate records retention facility as outlined in [CPR](#)

[400.2.20](#), *Retention and Disposition of Recorded Information*.

Note: Additional information on performing work-site inspections is provided in [Attachment 4V-2](#), "Performing Work-Site Inspections."



EMERGENCIES, ACCIDENTS, AND INJURIES

Managers and [Sandia Delegated Representatives SDR](#) shall ensure that contractors performing under contractor-directed contracts do the following:

- Follow emergency preparedness actions identified in the Project Safety and Health Plan.
- Direct [Members of the Workforce \(MOW\)](#) with non-emergency injuries or illness to the appropriate medical facility in accordance with [Chapter 16](#), "Health, Benefits, and Employee Services" or the Project Safety and Health Plan.
- Report injuries and illness by the requirements stated in Chapter 16 or the Project and Safety and Health Plan.
- Follow the requirements prescribed in [Section 18C](#), "Occurrence Reporting" or the Project and Safety and Health Plan.
- Follow SNL [Internal Management-Notification Process for Employee Injuries](#).

Guidance

Additional guidance and checklists may be found in [Chapter 15](#), "Emergency Preparedness and Management."

LEASED EQUIPMENT FOR CONSTRUCTION-LIKE WORK

Requirements

Managers shall ensure that the following criteria are consistent with Sandia requirements when leasing or procuring equipment (e.g., backhoes, bobcat loaders, drill rigs) to perform construction-like work on [Sandia-controlled premises](#):

- Operators are appropriately trained and qualified to use such equipment.
- Safe work practices are in place and followed.
- Work authorizations of the operators are consistent and current.




Note: See [Chapter 11](#), "ES&H Training" for information on line-managed [on-the-job training](#) for equipment operators.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to contracted construction and construction-like activities include:

Hazard/Activity	Reference
Chemical use, handling, and storage.	See Chapter 5 , "Fire Protection." See Section 6B , "Asbestos." See Section 6D , "Hazard Communication Standard." See CPR400.1.1.24/ GN470094 , "Handling Chemicals at SNL/CA."
Confined spaces.	See Section 6I , "Confined Space Entry."


Demolition operations.	See Decontamination and Demolition (D&D) Program . See Chapter 9 , “Explosives Safety.”
Electrical safety and energy control practices.	See Section 4B , “Electrical Safety Practices.” See Section 4C , “Lockout/Tagout (LOTO).”
Elevated work surfaces.	See Section 4F , “Ladders, Scaffolds, and Elevating Work Platforms.” See Section 4G , “Fall Prevention/ Fall Protection.”
Emergencies and unusual events.	See Chapter 15 , “Emergency Preparedness and Management.” See Chapter 16 , “Health, Benefits, and Employee Services.” See Chapter 18 , “Reporting, Investigating, and Correcting ES&H Events.”
Excavation, trenching, and floor or wall penetrations.	See Section 4H , “Excavations, Trenches, and Floor or Wall Penetrations.”
Eye and face protection, foot and hand protection, head protection, hearing protection, and respiratory protection.	See Section 4L , “Personal Protective Equipment (PPE).” See Section 6C , “Respiratory Protection.” See Section 6H , “Noise Exposure and Hearing Conservation.”

 <p>Fire protection and/or prevention and housekeeping.</p>	<p>See Section 4P, "Housekeeping."</p> <p>See Section 6G, "Lasers and Intense Light."</p> <p>See Chapter 5, "Fire Protection."</p>
<p>Hazardous material transporting and waste.</p>	<p>See Chapter 12, "Packaging and Transportation of Hazardous Material."</p> <p>See Section 19A, "Hazardous Waste Management."</p>
<p>Hot work and use of pressurized gases.</p>	<p>See Section 4D, "Pressure Safety Operations."</p> <p>See Section 4E, "Hot Work Safety."</p>
 <p>Material handling operations, heavy or mobile equipment and motor vehicle use.</p>	<p>See Section 6H, "Noise Exposure and Hearing Conservation."</p> <p>See Section 4J, "Material Handling - Cranes, Hoists, Rigging, and Forklifts."</p> <p>See Section 6J, "Nonionizing Radiation."</p> <p>See Section 4K, "Traffic Safety."</p> <p>See Section 4R, "Light and Heavy Earth Moving Equipment."</p>
<p>Power tools and equipment use.</p>	<p>See Section 6C, "Respiratory Protection."</p> <p>See Section 4N, "Industrial Machine and Portable Power Tool Safety."</p>
 <p>Radioactive material.</p>	<p>See MN471016, <i>Radiological Protection Procedures Manual</i>, Chapter 6, "Control of Radioactive Material."</p>


Other training requirements.	See Chapter 11 , "ES&H Training."
Technical Work Documents (TWDs).	See Chapter 21 , "Technical Work Documents (TWDs)."

REFERENCES

Requirements Source Documents

-  [10 CFR 850](#), *Chronic Beryllium Disease Prevention Program.*
- [10 CFR 851](#), *Worker Safety and Health Program; Final Rule.*
- [29 CFR 1910](#), *Occupational Safety and Health Standards.*
- [29 CFR 1926](#), *Safety And Health Regulations for Construction.*
- DOE, DOE Acquisition Regulation (DEAR) [970-5204-2](#), *Integration of Environmental, Safety and Health Into Work Planning and Execution.*
- [DOE-STD-1149-2002](#), *Safety & Health Program for DOE Construction Projects.*

Implementing Documents

-  SNL, [CPR400.1.1.28/MN471004](#), *Electrical Safety Manual.*
- SNL, [CPR500.1.2.1](#), *Integrated Safety Management System Implementation Plan.*
- SNL, [CPR500.1.2](#), *Procurement Manual.*
- SNL, [SF 6432-CN](#), Section II, "Standard Terms and Conditions for Fixed Price Commercial Construction."
- SNL, [SF 6432-TM](#), Section II, "Standard Terms and Conditions for Time and Materials Labor Hour Contracts."

SNL, Standard Specification, [Section 01065](#), *Environment, Safety and Health Requirements*.

SNL, Standard Specification, Section [01065S](#), *ES&H for MESA Construction Contracts*.

SNL, Standard Specification, Section 01860, *Safety Provisions*.

Related Documents

ANSI A10.33, *Safety and Health Program Requirements for Multi-Employer Projects*.

ANSI/IEEE C2-2002, *National Electrical Safety Code*.

DOE/ID-10447, *Construction Safety Reference Guide*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

International Code Council (ICC), *International Building Code, International Fire Code, International Plumbing Code, International Mechanical Code, International Fuel Gas Code, International Energy Conservation Code*.

NFPA 70, *National Electrical Code (NEC)*.

NFPA 70E, *Standard for Electrical Safety Requirements for Employee Workplaces*.

NFPA 101, *Life Safety Code*.



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ES&H Manual

SECTION 4J – MATERIAL HANDLING – CRANES, HOISTS, AND FORKLIFTS

Subject Matter Expert: [Danny Donald](#); CA Counterpart: [Herman Armijo](#)

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*Indicates a substantive change

- [Applicability](#)
- [*Training and Qualifications](#)
- [*Inspections and Maintenance](#)
- [*Procurement of Material-Handling Equipment](#)
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- [Replacement Parts](#)
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- [Personnel Qualifications and Training](#)
- [Overhead and Gantry Cranes](#)
- [Hoists](#)
- [Mobile Cranes](#)
- [Forklift Trucks](#)
- [Wire Rope and Slings](#)
- [Rigging Accessories](#)
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- [Below-the-Hook Lifting Devices](#)
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- Attachments
 - [4J-1](#) - Inspection Summaries
 - [4J-2](#) - Critical Lift Plan
 - [*4J-3](#) - Examples of Suspended Load Hazards
 - [4J-4](#) - List of Currently Recognized Overhead Rigging Equipment Manufacturers
- Forms
 - SF 2001-CLD, Critical Lift Data Sheet ([Word file](#)/[Acrobat file](#))
 - SF 2001-CLF, Critical Lift Data Sheet - Forklift ([Word file](#)/[Acrobat file](#))
 - SF 2001-CMH, Inspection Checklist for Motorized Hand Trucks ([Word file](#)/[Acrobat file](#))
 - SF 2001-CSL, Chain Sling Inspection Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-FIH, Frequent Inspection Form Hoists ([Word file](#)/[Acrobat file](#))
 - SF 2001-FMC, Frequent Inspection Form Mobile Cranes ([Word file](#)/[Acrobat file](#))
 - SF 2001-FOC, Frequent Inspection Form Overhead Cranes ([Word file](#)/[Acrobat file](#))
 - SF 2001-MLD, Miscellaneous Lifting Equipment Checklist ([Word file](#)/[Acrobat file](#))
 - SF 2001-MMS, Metal Mesh Sling Inspection Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-PIH, Pre-Use Inspection Form Non-Mandatory Hoists ([Word file](#)/[Acrobat file](#))
 - SF 2001-POC, Pre-Use Inspection Form Overhead Cranes ([Word file](#)/[Acrobat file](#))
 - SF 2001-SCF, Inspection Checklist for Forklifts ([Word file](#)/[Acrobat file](#))
 - SF 2001-SML, Below-the-Hook Lifting Devices Inspection Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-SWS, Synthetic Web Sling Inspection Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-VDL, Vacuum Lifting Devices Inspection Form ([Word file](#)/[Acrobat file](#))



[file](#))

- SF 2001-WRS, Wire Rope Sling Inspection Form ([Word file](#)/[Acrobat file](#))
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*APPLICABILITY

For purposes of this document, Members of the Workforce are:


- Sandia employees.
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."



This section DOES **NOT** apply to the procurement and management of [construction](#) or [construction-like activities](#) acquired from private [contractors](#) or suppliers.

Note: SNL has adopted [DOE-STD-1090-2004](#), "Hoisting and Rigging" to replace MN471007, *SNL Hoisting & Rigging Manual*. The majority of this section is structured to correspond with and link to DOE-STD-1090-2004.

The requirements presented in [DOE-STD-1090-2004](#) and this section are mandatory and set minimum standards for material-handling operations on SNL-controlled premises. Manufacturers' requirements shall be followed if they are more stringent than requirements discussed in either DOE-STD-1090-2004 or this section. For questions regarding hoisting and rigging, consult the [cranes, hoists, and rigging program contact](#) or the [SNL Material Handling website](#). For terms and definitions related to material handling see DOE-STD-1090-2004, [Chapter 1](#), "Terminology and Definitions."



Employees operating cranes and hoists, handling rigging, or working around any material handling equipment shall work with caution, which includes:

- Not working under or near [suspended loads](#).
- Keeping fingers away from pinch points.
- Using tag lines as much as possible.
- Understanding that they are responsible for the lift and that anyone can stop a lift if

a hazardous situation is observed.

- Wearing proper **personal protective equipment** (PPE) (the hazard of the lift will determine level of protection needed).

Additional cautions for mobile cranes include:



- Exercising caution near long spans of overhead power lines, since wind can cause the power lines to sway laterally and reduce the clearance between the crane and the power line.
- Exercising caution when traveling over uneven ground that could cause the crane to weave or bob into power lines.
- Evaluating jobsites before beginning work to determine the safest areas for material storage, the best placement for machinery during operations, and the size and type of machinery to be used.



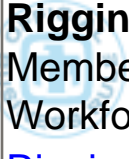
*TRAINING AND QUALIFICATIONS

*Training

The following table incorporates **and meets the intent of** the training requirements in [DOE-STD-1090-04, Chapter 6](#).

Work Activity or Role	Required	Recommended
Members of the Workforce (material-handling equipment operators and maintenance personnel) who operate cranes and hoists and perform rigging in their course of work.	RGH100 RGH100R (retraining interval is 36 months)	RGH201

<p>Operators of miscellaneous lifting devices (Chapter 16 in DOE-STD-1090-2004).</p>	<p>RGH137 (refresher every 3 years)</p>	<p>RGH201 RGH100 RGH134</p>
<p>Members of the Workforce who supervise crane, hoist, or forklift operators.</p> 		<p>FKL153S RGH100 RGH134 RGH137 RGH201</p>
<p>Forklifts: Members of the Workforce who operate forklifts.</p> <p>Note: Completion of proper forklift training is required before an operator's completion card will be issued or reissued.</p> 	<p>FKL153 (includes the content of FKL110)</p> <p>Note: Upon successful completion of FKL153, course credit will be given for both FKL153 and FKL110 which is included in the course content for FKL153.</p> <p>FKL153R (does not include the content of FKL110) (retraining interval is 36 months)</p> <p>FKL110 (in addition to FKL153R for operators of forklifts and motorized hand trucks, retraining interval is 36 months)</p>	<p>RGH201</p>

 <p>Motorized Hand Trucks: Members of the Workforce who operate motorized hand trucks.</p>	<p>FKL110 (retraining interval is 36 months after the first completion of FKL153 or FKL110. FKL153R is not applicable.)</p> <p>Note: As with any compliance course, if FKL110 is needed, it must be entered in the individual's To Do List in TEDS, even if originally taken as part of FKL153 training.</p>	<p>RGH201</p>
 <p>SNL mobile crane operators in New Mexico who operate cranes or hoists with a capacity of 2 tons or more must comply with Hoisting Operators Safety Act (HOSA).</p>	<p>SNL/NM Mobile Crane Operators Training/Refresher training. Comply with NM Hoisting Operators Safety Act which includes alternative qualifications through NCCCO (National Commission for the Certification of Crane Operators).</p>	<p>RGH201</p>
 <p>Rigging Inspections: Members of the Workforce (Qualified Rigging Equipment Inspectors (QREIs)) who perform the required annual rigging equipment inspections.</p>	<p>RGH134 or acceptable equivalent (retraining interval is 36 months)</p>	<p>RGH201</p>

Crane and Hoist Inspectors

Maintenance Personnel



See [DOE-STD-1090-2004, Chapter 6](#) for guidance.

Note: Specialized training from outside resources may be required. The providers of outside training resources are responsible for the training content and compliance with [DOE-STD-1090-2004, Chapter 6](#), and applicable OSHA regulations and ANSI standards.

[RGH201](#)

Sandia SMEs



[RGH100](#)
[RGH134](#)
[RGH137](#)
[RGH201](#)
[FKL153](#)

- Certified Rigging Equipment Inspector (QREI) or other equivalent training.
- Overhead Crane inspector training.
- Any supplier Mobile Crane inspector training.
- Mobile Crane operator training (Facilities class provided by WRRC).

- | | | |
|--|--|---|
| | | <ul style="list-style-type: none"> • Forklift instructor (Ives and Associates). • Basic Rigging course. |
|--|--|---|

*Qualifications

*Requirements

SNL material-handling equipment operators shall meet [operator qualification](#) requirements as stated in [DOE-STD-1090-2004, Chapter 6](#), "Personnel Qualifications and Training."


SNL Crane and Hoist inspectors and Maintenance personnel shall meet requirements as stated in DOE-STD-1090-2004, [Chapter 6](#), "Personnel Qualifications and Training." (See [Training](#) above for SNL specific training)

In addition to the [DOE-STD-1090-2004](#) requirements:

- Managers shall be responsible for ensuring that only qualified SNL operators operate SNL-owned material-handling equipment.
- *Mobile Crane operators in CA shall have a valid certificate of competency (certificate) issued in accordance with [8 CCR §5006.1](#) by an Accredited Certifying Entity for the type of crane to be used.

- Each SNL/NM mobile crane operator (MCOs) shall obtain an operator's license from the State of New Mexico. For SNL employees who operate mobile cranes of 2 or more tons in capacity and who cannot qualify under the [New Mexico Hoisting Operators Safety Act](#) (HOSA) requirements, SNL has implemented a State of New Mexico approved "in-house" exemption. To obtain exemption SNL employees shall:


- Obtain management authorization to operate mobile cranes.
- Successfully complete an SNL-provided MCO "in-house" training course (good for one year).



Note: The “In-House” exemption can be used once and is good for one year. At the end of that year, employees must obtain a NM crane operator’s license. NM HOSA has specific criteria for obtaining a license (500 seat-time hours, taking a written and practical exam). For operators who cannot qualify for the mobile crane operator license because of “seat-time” issues, SNL/NM will provide mobile crane operators the opportunity to attend and qualify under the NM HOSA by passing the mobile crane operators certification provided by NCCCO certification. Our crane training contractor, Industrial Training International, Inc., can provide this qualification.

- Pass an annual Department of Transportation (DOT) drug screen and physical exam.

Note: Operators are then part of the Mobile Crane Operators Drug Screen Program (random testing).

- 
- Forklift operators shall not operate a forklift unless their training is current.
 - Forklift operators shall possess a valid state driver's license.

Guidance

Qualified Rigging Equipment Inspectors (QREIs) should maintain qualifications by performing at least 8 hours of rigging equipment inspections per year and by keeping training up to date.

*INSPECTIONS AND MAINTENANCE

Requirements



Managers shall be responsible for ensuring:

- Inspection of the following types of equipment, as stated in Attachment 4J-1: (all lifting devices require inspections; see specific area for requirements):
 - Below-the-hook lifting devices

- [Forklifts](#)
- [Mobile cranes – SNL-owned](#)
- [Mobile cranes – contractor-owned](#)
- [Overhead cranes and hoists](#)
- [Rigging accessories](#)
- [Slings](#)
- [Miscellaneous Lifting devices \(initial, pre-use, and annual inspections\)](#)

- All [rigging](#) equipment requiring periodic, documented inspections (as specified in [Attachment 4J-1](#)) have a permanent means of identification (e.g., an attached tag or label) with a unique stenciled or stamped SNL identifier. The identification numbers are organization specific and shall have a highly visible means of noting the annual inspection due date.
- A Qualified Rigging Equipment Inspector ([QREI](#)) inspects rigging equipment annually or as required.

Equipment owners or operators shall request or perform inspections and maintenance as necessary for:

- Cranes, hoists, [and miscellaneous lifting equipment](#) (performed by the [Technical Service Team](#) for initial and periodic inspections, load tests, repairs, modifications, and preventive maintenance).
- Forklifts (performed by [Fleet Services](#)).
- Rigging equipment (See [QREI list](#) for qualified inspectors).

*PROCUREMENT OF MATERIAL-HANDLING

EQUIPMENT

Requirements

Members of the Workforce shall:

- Order only lifting devices or rigging equipment that meet DOE, OSHA, and ANSI standards.

Cranes or Hoists

Members of the Workforce shall:

- Acquire new [overhead cranes](#) or [hoists](#) through the design review process discussed in:
 - The [SNL Facilities Design Standards Manual](#).
 - CPR500.2.1, *Procurement Manual*, [Section 3.1.2.5](#), "Commodity Buyers and Restricted Items."
- Ensure that overhead cranes or hoists meet design requirements of the most current Crane Manufacturers Association of America (CMAA) 70 and 74 design specifications. Purchase requisitions shall be reviewed by the [cranes, hoists, and rigging program contact](#).
- Submit a request for design drawings and specifications describing hoists to [Electrical & Structural Engineering](#) for review and approval.
- Before ordering, review [Appendix A, "Procurement Guidelines"](#) in DOE-STD-1090-2004, Miscellaneous Lifting Devices (See Appendix A DOE-STD-1090-04).

Note: Facilities Engineering routes approved design drawings and specifications to the [Planning Services Team](#) and then to the appropriate [Division ES&H Team](#) for review and approval.

Forklifts

Managers shall consult [Fleet Services](#) and the [forklifts contact](#) for acquisition of new forklifts.

Rigging Equipment

Members of the Workforce shall:

- Purchase proof-tested rigging for use in [critical lifts](#). See the "Type of Inspection" column under "[Rigging Accessories](#)" and "[Slings](#)" in Attachment 4J-1 and [Appendix A](#), "Procurement Guidelines" and specific chapters of [DOE-STD-1090-2004](#), which has special sections designated as "Critical Lifts."
- When ordering any type of [sling](#) or multiple-leg sling assembly, ensure that the manufacturer attaches a tag identifying:
 - Date of manufacture.
 - Name of manufacturer.
 - Capacity.
 - Length (reach).
 - Angle capacity (for multi-leg slings).

Guidance

Equipment owners, when ordering slings and other rigging equipment, should ask the manufacturer to [perform a proof test and](#) supply a certificate of [proof testing](#). [Equipment owners should](#) maintain a copy of [the certificate](#) in an equipment history file for the life of the device. (A [proof test](#) and certificate is required for [rigging](#) equipment that is to be used for critical lifts.) Purchases of all rigging equipment should follow quality-significant purchasing requirements.

In accordance with [CPR001.3.2](#), [CPR500.2.1](#), [10 CFR 830](#), and [DOE O 414.1C](#), the Quality-Significant (Q-Sig) Procurement Process applies to the purchase of goods and services where quality aspects are of vital importance due to their potential to negatively impact the safety or security of people, property, and the environment.

- Significantly impact the safe operation of any SNL facility or activity; or
 - Be used in any safety-significant or safety-critical system, component, or application whose failure could adversely affect people, property, or the environment.
-

*RECORDKEEPING

*Requirements

Managers shall be responsible for maintaining SNL-specific records for [crane](#), [hoist](#), [rigging](#), and [forklift](#) operations [as required by the Sandia Records Retention and Disposition Schedule](#).

REPLACEMENT PARTS

Requirements

Equipment owners and operators shall:

- Use only replacement parts from the original equipment manufacturer or parts that are equal to the manufacturer's specifications for all material-handling equipment.
 - **Not** use any [suspect parts](#).
 - Refer to [Attachment 4J-4](#).
-

CRITICAL LIFTS

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 2](#), "Critical Lifts," and [Attachment 4J-2](#), "Critical Lift Plan."

In addition to the [DOE-STD-1090-2004](#) requirements, managers shall be responsible for ensuring that:

- Rigging devices used in critical lifts have been [proof tested](#) or have evidence of proof testing, such as the manufacturer's proof-testing certificate.
- A critical lift plan is prepared in accordance with [Attachment 4J-2](#).

Note: Some chapters in the [DOE-STD-1090-2004](#) have chapter-specific critical lift requirements. Check each chapter for special critical lift requirements.

- An appointed person shall classify each lift into one of the DOE categories (ordinary, critical, or [pre-engineered production](#)) prior to planning the lift.
- A lift shall be designated critical if any of the following conditions are met:
 - The load item, if damaged or upset, would result in a release into the environment of radioactive or hazardous material exceeding the established permissible environmental limits.
 - The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility, or project operation.
 - The cost to replace or repair the load item, or the delay in operations of having the load item damaged, would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.
 - A lift not meeting the above criteria shall also be designated critical if mishandling or dropping of the load would cause any of the above noted consequences to nearby installations or facilities.
- Further site-specific criteria may be developed to supplement those cited above and may include loads which require exceptional care in handling because of size, weight, close-tolerance installation, or high susceptibility to damage, as well as lifts using multiple pieces of lifting equipment."

PRE-ENGINEERED PRODUCTION LIFTS

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 3](#), "Pre-engineered Production Lifts."

LIFTING PERSONNEL

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 4](#), "Lifting Personnel." "Lifting personnel is always a "Critical Lift."

HOSTILE ENVIRONMENTS

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 5](#), "Hostile Environments."

PERSONNEL QUALIFICATIONS AND TRAINING

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 6](#), "Personnel Qualifications and Training," outlined above in [Training and](#)

[Qualifications.](#)

OVERHEAD AND GANTRY CRANES

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 7](#), "Overhead and Gantry Cranes."



HOISTS

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 8](#), "Hoists."

Chapter 8 applies to the following types of equipment:

- Overhead hoists (underhung).
- Jib cranes/hoists (floor- and wall-mounted).
- Monorail systems.
- Manual-lever-operated hoists (wire rope, chain, and web-strap types).
- Wire-rope ratchet and pawl lever-operated hoists should not be used for lifting service (see [Figure 8-8 in DOE-STD-1090-2004](#)).
- Systems used for transporting personnel and specially insulated hoists used for handling electrically energized power lines require special considerations and are not included in this chapter.



Note : These lifting devices require initial, pre-use, and periodic (annual) inspections.



MOBILE CRANES

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [mobile crane](#) operators in New Mexico who operate cranes or hoists with a capacity of 2 tons or more must comply with Hoisting Operators Safety Act (HOSA). (Consult training section above for more information).

In addition to the [DOE-STD-1090-2004](#) requirements, Members of the Workforce shall, when using a [crane](#) or erecting a structure, building, or tower having a height greater than 200 feet:

- Get Federal Aviation Administration (FAA) approval using Federal Aviation Administration FAA [Form 7460-1](#), Notice of Proposed Construction or Alteration. This form shall be submitted to the FAA a minimum of 30 days in advance of using a crane.

Note: Albuquerque FAA office telephone number is: 764-1230.

- Notify the Albuquerque International Sunport (842-4366).

Guidance

Members of the Workforce may consult the [cranes, hoists, and rigging program contact](#) for assistance.



FORKLIFT TRUCKS

Requirements

Forklift operators shall follow the requirements in DOE-STD-1090-2004, [Chapter 10](#), "Forklift Trucks."

Note: For information on using forklifts and motorized hand trucks to conduct critical lifts, see "[Critical Lifts](#)."

Attachments

In addition to the [DOE-STD-1090-2004](#) requirements, forklift operators who use forklift attachments shall:

- Have attachments inspected, at least annually, by a qualified inspector ([QI](#) or [QREI](#)).
- Use forklift attachments only after:
 - Verifying that the forklift data plate has been changed to describe the change in handling characteristics (e.g., reduced capacity) when using attachments. Consult the [forklifts](#) contact for clarification and assistance.
 - Verifying that the attachment (including fork extensions) has a corrosion-resistant nameplate having the following information:
 1. Model number.
 2. Serial number on hydraulically actuated attachments.
 3. Maximum hydraulic pressure (on hydraulically actuated attachments).
 4. Weight.
 5. Capacity.
 6. The following instructions (or equivalent), "Capacity of truck and attachment combination may be less than capacity shown on attachment. Consult truck nameplate."
 - Being aware of the effects of attachments on forklift capacity and stability.

Note: Performing free-rigging activities (using the forklift like a crane with the load suspended below the tines), is considered a “critical lift,” see [“Critical Lifts.”](#)

High Winds:

In addition to the [DOE-STD-1090-2004](#) requirements, forklift operators who need to move high-profile loads in high winds (at or above 40 mph) shall:

- Avoid high-profile lifts from loading docks or trucks higher than four feet.
- Not conduct a lift regardless of the start/stop position of the load if uncertain about the safety of a high-profile load.

Note: Consult the [wind advisory contact](#). Wind speeds may be reported in knots, which can be multiplied by 1.15 to obtain mph equivalent.

WIRE ROPE AND SLINGS

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 11](#), "Wire Rope and Slings."

In addition to the DOE-STD-1090-2004 requirements, managers shall be responsible for ensuring that all:

- A Qualified Rigging Equipment Inspector ([QREI](#)) inspects all rigging equipment annually.
- SNL [slings](#) have a permanent means of identification (e.g., an attached tag or label) with a unique stenciled or stamped SNL identifier. The identification numbers are organization specific and shall have a highly visible means of noting the annual inspection due date.
- Swaged and pour socket slings are certified as being [proof tested](#) (DOE-STD-

1090-2004, [Section 11.3.2.2](#)).



RIGGING ACCESSORIES

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 12](#), "Rigging Accessories."

In addition to the DOE-STD-1090-2004 requirements, managers shall be responsible for ensuring that all miscellaneous rigging devices (requiring periodic documented inspections), have a permanent means of identification (e.g., an attached tag or label) with a unique stenciled or stamped SNL identifier. The identification numbers are organization specific and shall have a highly visible means of noting the annual inspection due date.



LOAD HOOKS

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 13](#), "Load Hooks."

BELOW-THE-HOOK LIFTING DEVICES

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 14](#), "Below-the-Hook Lifting Devices."



In addition to the [DOE-STD-1090-2004](#) requirements, managers shall be responsible for ensuring that all below-the-hook lifting devices (BTHLDs) have a permanent means of identification (e.g., an attached tag or label) with a unique stenciled or stamped SNL identifier. The identification numbers are organization-specific and shall have a highly visible means of noting the annual inspection due date.

Guidance

Members of the Workforce who design new, or modifications to, special-use lifting devices should see SNL DG 10221/A and SNL [Design Guides 10220 and 10220](#) for guidance for designing, approving, fabricating, and testing these devices.

*CONSTRUCTION HOISTING AND RIGGING EQUIPMENT

*Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 15](#), "Construction Hoisting and Rigging Equipment Requirements."

Note: At SNL/NM, this section (4J) does **not** apply to the procurement and management of construction or construction-like activities acquired from private contractors or suppliers. See [Section 4V](#), "ES&H for Contracted Construction and Construction-Like Activities."

MISCELLANEOUS LIFTING DEVICES

Requirements

Members of the Workforce shall follow the requirements in DOE-STD-1090-2004, [Chapter 16](#), "Miscellaneous Lifting Devices."

(Note: requires initial, pre-use, and periodic annual inspections).

*PROGRAM REVISION

*Requirements

SNL Program SMEs shall make program revisions based on:

- Changes to codes and/or regulations.
- Missing or confusing information.
- Lessons Learned.
- Results of Self-Assessments which have identified areas of concern.

For further training recommendations, refer to the "[Training and Qualification](#)" section above.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to management of material handling, [cranes](#), [hoists](#), and [forklifts](#) include:

Hazard/Activity	Reference
Reporting handling	Section 18F , "Reporting Vehicle and Property Damage"
Handling equipment	Section 18F , "Reporting Vehicle and Property Damage"
Accidents	Section 18F , "Reporting Vehicle and Property Damage"

*REFERENCES

*Requirements Source Documents

[8 CCR § 5006](#), *Crane and Hoisting Equipment Operators - Qualifications*.

 [14 CFR 77](#), *Objects Affecting Navigable Airspace*, Section 13, "Construction or Alteration Requiring Notice."

[DOE-STD-1090-2004](#), *Hoisting and Rigging Standard*.

[New Mexico Hoisting Operators Safety Act \(HOSA\)](#), 60-15-1 NMSA 1978 et seq.

Implementing Documents

SNL, [CPR 400.2.20](#), "Management of Information throughout its Life Cycle."

SNL, [CPR500.2.1](#), *Procurement Manual*, "Special Approvals and Notification Copies."

SNL, [Facilities Design Standards Manual](#).

 SNL, [Sandia Records Retention and Disposition Schedule](#) .

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

[10 CFR 830](#), "Nuclear Safety Management."

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

[29 CFR 1926](#), *Safety and Health Regulations for Construction*.

ANSI/ASME B30.2-2001, *Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)*.

 ANSI/ASME B30.5-2004, *Mobile and Locomotive Cranes*.

ANSI/ASME B30.9-2003, *Slings*.

ANSI/ASME B30.10-2005, Hooks: *Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings*.

ASME B30.11-2004, *Monorails and Underhung Cranes— Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings*.

ASME B30.16-2004, *Overhead Hoists (Underhung)*.

ANSI/ASME B30.17-2003, *Overhead and Gantry Cranes (Top Running Bridge , Single Girder, Underhung Hoist)*.

ANSI/ASME B30.20-2003, *Below-the-Hook Lifting Devices*.

ANSI/ITSDF B56.1-2005, *Safety Standard for Low-Lift and High-Lift Trucks*.

ANSI/SIA A92.2-2001, *Vehicle Mounted Elevating and Rotating Aerial Devices*.

ANSI/SIA A92.3-1990, *Manually-Propelled Elevating Work Platforms*.

ANSI/SIA A92.5-1992, *Boom-Supported Elevating Work Platforms*.

ANSI/SIA A92.6-1999, *Self-Propelled Elevating Work Platforms*.

[8 CCR § 3657](#), "Elevating Employees With Lift Trucks."

[8 CCR § 3664](#), "Operating Rules."

CMAA Specification #70, *Specifications for Top Running Bridge & Gantry Type Multiple Girder Electric Overhead Traveling Cranes* (2004).

CMAA Specification #74, *Specifications for Top Running and Under Running Single Girder Electric Overhead Cranes Utilizing Under Running Trolley Hoist* (2004).

[DOE O 414.1C](#), "Quality Assurance."

SNL, [CPR001.3.2](#), "Corporate Quality Assurance Program."

SNL, [CPR500.2.1](#), "Procurement Manual."

SNL, "[Design Guide 10220: Handling Gear](#)" (1999).

SNL, "[Design Guide 10221: Lifting Gear](#)" (1998).

SNL, *ES&H Manual*, [Section 4V](#), "ES&H for Contracted Construction and Construction-Like Activities."

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Sponsor: Dori Ellis, 4000, Acting

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IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 2 – CROSS-CUTTING ISMS ELEMENTS

MN471001, Issue S

Revision Date: [May 25, 2007](#); Replaces Document Dated: November 15, 2006

* Indicates a substantive change

- [Chapter 2](#) - Overview
- [Section 2A](#) - Plan Work
- [Section 2B](#) - Analyze Hazards
- [Section 2C](#) - Control Hazards
- *[Section 2D](#) - Perform Work
- [Section 2E](#) - Feedback and Improve

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Manual Contents](#)

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*SECTION 6U – HAZARDOUS MATERIAL (CHEMICAL AND BIOLOGICAL) INVENTORY

Subject Matter Expert: [Randy Castillo](#); CA Counterpart: [Mark Brynildson](#)

MN471001, Issue E

Revision Date: [April 23, 2007](#); Replaces Document Dated: September 1, 2006

Review Date: August 16, 2006

* Indicates a substantive change

- 
- [Applicability](#)
 - [Hazardous Material Inventory Responsibilities](#)
 - [Identify Where Hazardous Materials are Stored](#)
 - [Barcode and Report Hazardous Materials Received](#)
 - [Report Static Hazardous Material Inventory Information](#)
 - [Transfer or Removal of Hazardous Materials in the CIS Inventory](#)
 - [CIS Inventory Reconciliation](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [6U-1](#) - Barcoding Hazardous Materials
 - Forms
 - SF 2001-BAI, Biological Organism/Toxin Inventory Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-CIF, Static Inventory Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-CIG, Gas Cylinder Inventory Incoming Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-CII, Hazardous Material Inventory Incoming Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-CIL, Location Description Form ([Word file](#)/[Acrobat file](#))
 - SF 2001-CIT, Hazardous Material Transfer/Removal Form ([Word file](#)/[Acrobat file](#))

APPLICABILITY

This section applies to all projects and activities that use or store [chemicals](#) and/or biological materials as defined in [Section 6N](#), "Biological Agents and Biosafety."

For purposes of this chapter, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

Note: For the purposes of this section, the term "hazardous materials" shall be used in referencing both chemicals and biological materials.

HAZARDOUS MATERIAL INVENTORY RESPONSIBILITIES

Requirements

Managers of organizations that store or use hazardous materials shall be responsible for:

- Maintaining an accurate, current inventory of those hazardous materials.
- Following the procedures established in this section to maintain a current inventory in the corporate [Chemical Information System \(CIS\)](#). All tools and procedures for maintaining the hazardous material inventory can be found at the [CIS home page](#).
- Ensuring that hazardous material inventory quantities do not exceed OSHA Process Safety Management Threshold Quantities per [Section 6W](#), "Process Safety Management (PSM)."

- Ensuring Emergency Management requirements ([Chapter 15](#)) are met.

Guidance

Members of the Workforce should contact the CIS Help Line: 844-MSDS (NM and TTR) or 294-MSDS (CA) for information or assistance regarding the hazardous material inventory.

IDENTIFY WHERE HAZARDOUS MATERIALS ARE STORED

Requirements

Owners of locations where hazardous materials are stored or used shall complete SF 2001-CIL, "Location Description Form" ([Word file](#)/[Acrobat file](#)), when:

- A new hazardous material storage location is established.
- Ownership of a hazardous material storage location changes (e.g., new lab owner, new organization, retirement).
- A hazardous material storage location is decommissioned and all hazardous materials are permanently removed from the location.

Guidance

Owners who are moving an entire laboratory, or other hazardous material storage location, should contact the CIS Help Line: 844-MSDS (NM or TTR) or 294-MSDS (CA) with questions about the transfer of the hazardous material inventory.

BARCODE AND REPORT HAZARDOUS MATERIALS RECEIVED

Requirements

Members of the Workforce shall barcode ([see Attachment 6U-1](#)) and report, within five (5) business days of receipt, incoming hazardous material containers that have not already been barcoded as follows:

- Use SF 2001-CII, Hazardous Material Inventory Incoming Form ([Word file/Acrobat file](#)).

Note: If a hazardous material was ordered through Sandia's Just-In-Time (JIT) chemical vendor at SNL/NM, the barcode will already be attached to the container. Inventory information will have already been provided to CIS by the JIT vendor. No further action is required of Members of the Workforce.

- For gas cylinders, use SF 2001-CIG, "Gas Cylinder Form" ([Word file/Acrobat file](#)).

Note: When gas cylinders are ordered through Sandia's JIT compressed gas vendor, the vendor will provide inventory information directly to CIS personnel. This data is promptly input into the CIS and can be viewed using inventory reports available on the [CIS Home Page](#). No further action is required of Members of the Workforce.

- For [microorganisms](#) and [biological toxins](#), use SF 2001-BAI, "Biological Organism/Toxin Inventory Form" ([Word file/Acrobat file](#)).

REPORT STATIC HAZARDOUS MATERIAL INVENTORY INFORMATION

Requirements

Owners of locations where hazardous materials are maintained in a manner that prevents the possibility of affixing a barcode (such as when they are in tanks, baths, or other bulk storage containers, or when they are not otherwise contained) shall:

- Account for these hazardous materials as static inventory, with the assistance of

the CIS Help Line: 844-MSDS (NM or TTR) or 294-MSDS (CA) when:

- A tank, bath, or other bulk storage container (e.g., liquid nitrogen tank, propane tank, transformer oil tank, or plating tank) is first used for hazardous material storage.
- A tank, bath, or other bulk storage container has its hazardous material contents changed.
- [Uncontained chemicals](#) are first introduced to a site.



● Notify the CIS Help Line: 844-MSDS (NM or TTR) or 294-MSDS (CA) when:

- A tank, bath, or other bulk storage container is taken out of service.
- [Uncontained chemicals](#) are removed from a site.

Note: Owners of locations that have [bulk storage tanks](#) may be required to label their tanks. See [Section 10J](#), "Registering, Naming, and Labeling Bulk Storage Tanks," or the CIS Help Line: 844-MSDS (NM or TTR) or 294-MSDS (CA) for more information.

Guidance

Members of the Workforce should contact the CIS Help Line: 844-MSDS (NM or TTR) or 294-MSDS (CA) to help them determine whether certain hazardous material storage constitutes a static inventory.



TRANSFER OR REMOVAL OF BARCODED HAZARDOUS MATERIALS IN THE CIS INVENTORY

Requirements

Members of the Workforce shall:

- Remove the empty hazardous material container from the CIS inventory and



manage it according to site-specific waste management procedures.

Note: For material deemed [hazardous waste](#), submit a Waste Description Disposal Request (WDDR) for the container to be picked up by Waste Management Personnel for final disposal.

- Transfer a barcoded hazardous material container within the CIS inventory when the container is to be stored in a different hazardous material storage location.

Note: Members of the Workforce shall use one of the following options for transferring hazardous material containers to new storage locations within the CIS database:

- Use the “Transfer or Remove a Barcode from the Hazardous Material Inventory” capability on the CIS home page.
- Complete an SF 2001-CIT, “Hazardous Material Transfer/Removal Form” ([Word file](#)/[Acrobat file](#)) when computer access is not available, and forward Hazardous Material Transfer/Removal Forms to CIS administrative staff as soon as possible.
- Use a CIS portable barcode reader.



Members of the Workforce at SNL/NM and TTR shall:

- Promptly remove hazardous material containers and compressed gas cylinders from inventory upon final disposition of the container. Final disposition may include any of the following:
 - Disposing of a container in the regular waste stream.
 - Disposing of a container as hazardous waste.
 - Returning an empty gas cylinder to the JIT gas vendor.
 - Transferring a hazardous material container permanently off site.



Note: Members of the Workforce shall use one of the following options for removing hazardous material containers from the hazardous materials inventory:

- Use the "Transfer or Remove a Barcode from the Hazardous Material Inventory" capability on the CIS home page.
- Complete an SF 2001-CIT, "Hazardous Material Transfer/Removal Form" ([Word file](#)/[Acrobat file](#)) when computer access is not available, and forward the Hazardous Material Transfer/Removal Form to CIS administrative staff as soon as possible.
- Use a CIS portable barcode reader.

Note: It is the MOW's responsibility to ensure that empty hazardous material containers are removed from the CIS inventory in a timely manner. This ensures that the inventory remains accurate for environmental reporting, emergency planning, and hazard identification purposes.

Members of the Workforce at SNL/CA shall use one of the following options for removing hazardous material containers from inventory:

- Contact Waste Management Personnel; they will transmit the disposal information to CIS.
- Draw a line (black Sharpie pen suggested) through the CIS barcode if the online "Transfer or Remove a Barcode from the Hazardous Material Inventory" link, or a CIS portable barcode reader, is used to remove the CIS barcode from the inventory.
- Use the "Transfer or Remove a Barcode from the Hazardous Material Inventory" capability on the CIS home page.
- Complete an SF 2001-CIT, "Hazardous Material Transfer/Removal Form" ([Word file](#)/[Acrobat file](#)) when computer access is not available, and forward the Hazardous Material Transfer/Removal Form to CIS administrative staff as soon as possible.
- Use a CIS portable barcode reader.

Note: (SNL/CA): Gas cylinders purchased from JIT will be picked up and disposed of by the JIT vendor. No further action is required of Members of the Workforce.

Guidance

Members of the Workforce at SNL/CA may:

- Purchase barcode scanners with the assistance of CIS personnel.
- Call the CIS Help Line: 844-MSDS (NM or TTR) or 294-MSDS (CA) for information or assistance regarding the hazardous material inventory and information about purchasing a scanner.

CIS INVENTORY RECONCILIATION

Requirements

Managers of organizations that store or use hazardous materials shall conduct, or help CIS personnel conduct, annual CIS inventory reconciliations.

Note: Annual CIS inventory reconciliations are funded by ES&H. They are performed to ensure that inventories are accurate and to support effective hazard identification, hazard control, emergency planning and response, and reporting to regulatory agencies.

[ES&H coordinators](#) and laboratory owners whose responsibilities include storing or using hazardous materials shall assist CIS staff: 844-MSDS (NM or TTR) or 294-MSDS (CA) in scheduling and coordinating annual CIS inventory reconciliations.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to hazardous material inventory include:

Hazard/Activity	Reference
Biological Agents and Biosafety	Section 6N , "Biological Agents and Biosafety"
Chemical Exchange Program	Section 4P , "Housekeeping"
Control of hazardous materials	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"

Emergency Management	Chapter 15 , "Emergency Preparedness and Management"
Handling chemicals at SNL/CA	GN470094 , <i>Handling Chemicals at SNL/CA</i>
Labeling tanks	Section 10J , "Registering, Naming, and Labeling Bulk Storage Tanks"
Material Safety Data Sheet (MSDS) for newly developed hazardous materials	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Ozone-depleting substances	Section 17D , "Ozone-Depleting Substances"
Process Safety Management	Section 6W , "Process Safety Management"
Sandia Workplace Hazards Awareness System (SWHAS)	Section 4M , "Signs (Including SWHAS) and Tags"
Toxic substances	Section 6S , "Toxic Substances Control Act (TSCA)"

REFERENCES

Requirements Source Documents

[29 CFR 1900-1999](#), Occupational Safety and Health Act implementing regulations.

[40 CFR 300-372](#), Emergency Planning and Community Right-to-Know Act (EPCRA) implementing regulations.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[DOE O 450.1, Change 2](#), *Environmental Protection Program*.

Implementing Documents

California Health and Safety Code, [Chapter 6.95, §25500, et seq.](#)

[Corporate Chemical Information System \(CIS\) Home Page.](#)

New Mexico Administrative Code, [20.11.1 - 20.11.103 NMAC](#), Albuquerque/Bernalillo County Air Quality Control Board Regulations.

[PG470019](#), *SNL/NM Industrial Hygiene Program.*

[PG470196](#), *SNL/CA Industrial Hygiene Program.*

SNL, CPR400.1.1/MN471001, *ES&H Manual*, [Section 6W.](#)

SNL, CPR400.1.1/MN471001, *ES&H Manual*, [Section 10J.](#)

[SNL/CA Hazardous Materials Management Program/CIS Home Page.](#)



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IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 1 – INTRODUCTION TO ES&H

Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)
MN471001, Issue P (O not used)
Revision Date: [June 28, 2006](#); Replaces Document Dated: June 28, 2006
Review Date: September 20, 2004

* Indicates a substantive change

- [Chapter 1](#) Overview
 - [Section 1A](#) - Why ES&H
 - [Section 1B](#) - What Is the Scope
 - [Section 1C](#) - How ES&H Is Implemented
 - [*Section 1D](#) - Who Does What
-

OVERVIEW

This chapter describes the basics of Sandia's Environment, Safety, and Health (ES&H) Program: why, what, how, and who. It identifies the boundaries of the program, describes how requirements flow down to Sandia organizations, and defines ES&H roles and responsibilities.

Sandia's strategy for managing and implementing its ES&H Program is described in the [Integrated Safety Management System](#).

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ES&H Manual

*SECTION 6I – CONFINED SPACE ENTRY

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- [*Applicability](#)
- [*Training](#)
- [Evaluation and Classification of Confined Space](#)
- [Signs](#)
- [*Entry Into Permit-Required Confined Spaces](#)
- [Entry Into Non-Permit Confined Spaces](#)
- [Contractor Confined Space Entry Activities](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - *6I-1 - Sample Signs for Confined Spaces ([Word file/Acrobat file](#))
 - *6I-2 - Sample Permit Registration Information ([Word file/Acrobat file](#))
 - *6I-3 - Sample SNL/CA Forms ([Word file/Acrobat file](#))
- Forms
 - [SF 2001-CSA](#), Confined Space Checklist - Alternate/C5
 - [SF 2001-CSE](#), Confined Space Entry Permit
 - SF 2001-CSG, Generic Non-Permit Confined Space Checklist ([Word file/Acrobat file](#))
 - [SF 2001-CSR](#), Confined Space Checklist - Reclassification/C7
 - SF 2001-CSS, Confined Space Permit Sign-in/Sign-out Sheet for



Emergency Response ([Word file](#)/[Acrobat file](#))

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What is the Scope"

Except where noted, requirements and guidance within this document apply to Members of the Workforce who perform activities in confined spaces at SNL/NM, SNL/CA and all Sandia-controlled premises.

Note: [Confined space](#) hazards differ in scope and magnitude according to operational activities, safeguards, and the space itself. The regulatory standards addressing confined spaces are performance based. Therefore, the application of specific requirements is contingent upon numerous variables that differ with each space. Due to wide variation in confined spaces and associated activities, the industrial hygiene representative on the appropriate [Division ES&H Team](#) may be of assistance (consultation is mandatory at SNL/CA, as specified below) in determining the relevancy and application of various requirements to establish a safe [entry](#). In addition, the safety engineering representative on the appropriate [Division ES&H Team](#) can provide technical assistance, and regulatory interpretation regarding acceptable procedures related to equipment isolation and lockout/tagout.

*TRAINING

Requirements

Work Activity or Role	SNL/NM		SNL/CA	
	Required ^a	Recommended	Required ^a	Recommended

Supervisor authorizing entry (SAE)	CNF104^b	MED102 MED104	CNF105 CNF107	MED104 MED108
Space/equipment owners	N/A	CNF104^b	N/A	CNF105
Atmospheric monitoring (permit-required confined spaces [PRCSs] only)	CNF104^b	N/A	CNF124 CNF105 CNF107	MED108
Entrants and attendants (permit-required confined spaces [PRCSs])^b	CNF104^b	MED102 MED104	CNF105 CNF107	MED104 MED108
Entrants and attendants (non-permit confined spaces [NPCSS])^{b, c}	CNF101NP	N/A	CNF105 CNF107	MED104 MED108
Design of confined spaces	N/A	CNF104^b	N/A	CNF105
Coordination of facility operations	N/A	N/A	N/A	CNF105 CNF107
ES&H coordinators	N/A	CNF104^b	N/A	CNF105
Sandia delegated representatives (SDRs)	N/A	CNF104^b	N/A	CNF105 CNF107
Facilities construction representatives (including but not limited to field inspectors)	CNF104^b	N/A	CNF105 CNF107	N/A

^a Retraining is required every 3 years or at a more frequent interval, as necessary, to maintain an acceptable level of competency and proficiency with established requirements, practices, and procedures.

- At SNL/NM, the need for more frequent retraining is determined by the responsible manager in consultation with industrial hygiene personnel.
- At SNL/CA, industrial hygiene personnel participate in all confined space entries, preceded by pre-[entry](#) briefings. industrial hygiene personnel assess participants' understanding of confined space entry hazards/requirements during these briefings and observe entry activities to assess compliance with requirements. Retraining is recommended when industrial hygiene personnel determine that personnel do not demonstrate adequate proficiency.

^b CNF104 is a combination of CNF101 and CNF124. Required retraining date will be 36 months from last successful completion date of CNF101 and CNF124. If the last CNF101 and CNF124 completion dates are not the same date, the earlier of the two will be used to determine the retraining date.

^c SNL/CA does not differentiate the training requirements for permit-required versus non-permit confined space entry or attendant personnel.

Note: An exception to this policy may be granted by the SNL/CA Confined Space Entry Program Administrator. Members of the Workforce who are granted this exemption shall complete CNF101NP, the content of which will be determined by the site Confined Space Entry Program Administrator.

^d Training related to NPCSSs at SNL/NM may be completed by way of [CNF101NP](#), which is conducted by industrial hygiene personnel, and will be commensurate with the complexity of the entry requirements that pertain to the specific space and activity. This training also provides instruction for atmospheric monitoring, as appropriate.

EVALUATION AND CLASSIFICATION OF CONFINED SPACE

Requirements

[Space or equipment owners](#) shall be responsible for:

- Identifying areas not previously evaluated that may meet the definition of [confined space](#).
- Consulting the industrial hygiene representative on the appropriate [Division ES&H Team](#) to determine:

- If an area is a confined space.
- Whether a confined space is "[permit-required](#)" or "[non-permit](#)."

Note: At SNL/CA, a re-evaluation is performed by industrial hygiene personnel prior to each [entry](#) to determine if conditions within the space have changed or if the proposed work within it warrants its re-classification.

SIGNS


Note: At SNL/CA, all identified [confined spaces](#) are posted with a sign indicating the space's baseline classification.

Requirements

[Space or equipment owners](#) shall:

- Be responsible for ensuring that [confined spaces](#) have signs or other equally effective means to indicate the existence and location of such spaces, as well as any associated dangers.

Note: As implied above, other "equally effective means" may be used to communicate space information (e.g., training in combination with controlled access to the confined space). However, signs should be regarded as the principal method of warning.

- 
- Obtain appropriate signs (for examples of signs, see Attachment 6I-1 [[Word file/Acrobat file](#)]), as follows:
 - At SNL/CA, from industrial hygiene personnel.
 - At SNL/NM, via JIT.
 - Consult an industrial hygiene representative on the appropriate [Division ES&H Team](#) if additional information is needed regarding the posting of confined spaces.

Members of the Workforce shall **not** interpret the absence of signage as an indication that an area is **not** a confined space if the area otherwise appears to qualify as a [confined space](#). When in doubt, consult an industrial hygiene representative on the appropriate [Division ES&H Team](#) for an evaluation of the area.



*ENTRY INTO PERMIT-REQUIRED CONFINED SPACES

Requirements

Obtaining Entry Permits

Note: There are three different types of [confined space entry permits](#); each is designed to accommodate different [entry](#) conditions and levels of rigor necessary for entry. Confined Space Permits shall only be used for one work shift. Members of the Workforce involved in work that extends beyond a single work shift shall obtain a new permit. Attachment 6I-2 ([Word file/Acrobat file](#)) illustrates the type of information that shall be provided to obtain a permit.

Requirements

Members of the Workforce who plan to enter confined spaces shall consult [space/equipment owners](#) (at SNL/NM) or industrial hygiene personnel (at SNL/CA) to identify:

- Current status of confined spaces.
- Modifications/alterations to confined spaces.
- Conditions or activities that may adversely impact confined space entry.

Members of the Workforce at SNL/NM shall consult with industrial hygiene personnel, prior to the initiation of entry operations, under the following conditions:

- Activities involving hot work (welding, brazing, soldering).
- Activities where chemical materials are used (including gases).
- Activities involving the use of respiratory protection. (Exception: If the only airborne hazard is radiological, consultation with industrial hygiene is not necessary.)

Members of the Workforce at SNL/CA shall request industrial hygiene personnel to participate in the evaluation of the hazards and the determination of the safety requirements for each confined space entry.

To enter a [permit-required confined space](#) (PRCS), Members of the Workforce shall use the appropriate form as follows:

- At SNL/CA, use the Confined Space Entry Permit form (for an example, see Attachment 6I-3 [[Word file](#)/[Acrobat file](#)])
- At SNL/NM, use [SF 2001-CSE](#), Confined Space Entry Permit, which is available via the Corporate Forms web site.

After completion of the entry activity, Members of the Workforce shall submit the appropriate form (specified above), as follows:

- At SNL/CA, submit the completed form to the industrial hygiene organization.
- At SNL/NM, submit the completed form to the industrial hygiene Records Administrator.

Guidance

Members of the Workforce at SNL/NM who plan to enter confined spaces should consult an industrial hygiene representative on the appropriate [Division ES&H Team](#) for assistance in determining the necessary type of entry permit.

Using Alternate Procedures

Note: The use of alternate procedures is allowed for entry into a PRCS where the only potential or actual hazard is atmospheric, which can be controlled through ventilation alone.

Requirements

Supervisors authorizing entry (SAEs) shall be responsible for ensuring that:

- Inspection and monitoring data that support the use of alternate procedures are developed and made available to each [entrant](#).
- Alternate procedures are documented using the appropriate form as follows:
 - At SNL/CA, use the Confined Space Entry Permit form - **C5 Alternate Procedures** (for an example, see Attachment 6I-3 [[Word file](#)/[Acrobat file](#)]).
 - At SNL/NM, use [SF 2001-CSA](#), Confined Space Checklist - Alternate/C5, which is available via the Corporate Forms web site.
- After completion of the entry activity, the appropriate form is submitted as follows:
 - At SNL/CA, submit the completed form to the industrial hygiene organization.
 - At SNL/NM, submit the completed form to the industrial hygiene Records Administrator.

*Temporary Reclassification of Permit-Required Confined Spaces (PRCSs)

Note: Temporary reclassification of a PRCS as a [non-permit confined space \(NPCS\)](#) may occur when there is no potential or actual atmospheric hazard and all remaining

potential hazards may be eliminated without entry into the space. At SNL/CA, a re-evaluation is performed by industrial hygiene personnel, **in consultation with the Supervisor Authorizing Entry (SAE)**, prior to each entry to determine if conditions within the space have changed or if the proposed work within it warrants its re-classification.

Requirements

Supervisors authorizing entry (SAEs) shall be responsible for ensuring that:

- The appropriate checklist is used when performing activities in reclassified spaces:
 - At SNL/CA, use the Non-Permit Confined Space Checklist - **C7 Reclassification** (for an example, see Attachment 6I-3 [[Word file](#)/[Acrobat file](#)]).
 - At SNL/NM, use the [SF 2001-CSR](#), Confined Space Checklist - Reclassification/C7, which is available via the Corporate Forms web site.
- After completion of the entry activity, the appropriate checklist is submitted as follows:
 - At SNL/CA, submit the completed checklist to the industrial hygiene organization.
 - At SNL/NM, submit the completed checklist to the industrial hygiene Records Administrator.

General Responsibilities of Supervisors Authorizing Entry (SAEs)

Note: In addition to the summary of responsibilities presented below, specific SAE duties are described in the appropriate parts of this document. Relevant duties are also discussed, as appropriate, during required training (see "[Training](#)").

Requirements

SAEs shall:

- Ensure all necessary procedures, practices, and equipment for safe entry are in

place before and during entry to permit-required confined spaces (PRCSs).

- Ensure that permits are signed (i.e. endorsing the permit and approving entry).
- Ensure that [attendants](#) are on duty when Members of the Workforce enter PRCSs.
- Provide briefings to all personnel associated with the planned activities prior to allowing entries to permit-required confined spaces (PRCSs), regarding the following:
 - Hazards associated with the work.
 - Specific safeguards.
 - Identification of rescue/responder services.
 - Applicable emergency procedures.
 - Relevant permits.
- Ensure that Members of the Workforce who work in PRCSs are current with regard to required training.
- Terminate entry and cancel entry permits when:
 - Entry operations covered by a permit have been completed.
 - A condition that is **not** allowed under an entry permit arises in or near the PRCS.
- Remove unauthorized individuals who enter or attempt to enter PRCSs during entry operations.
- Ensure that entry operations remain consistent with the terms of relevant entry permits and that acceptable entry conditions are maintained, according to the following criteria:
 - When responsibility for an entry operation is transferred.
 - At intervals dictated by the hazards and operations performed within the

space.

- Ensure that SF 2001-CSS ([Word file](#)/[Acrobat file](#)) (Confined Space Permit Sign-In/Sign-Out Sheet for Emergency Response) is used with a permit or checklist under the following condition:
 - Different entrants other than those initially identified on the permit are involved in the entry activity.


General Responsibilities of Attendants

Note: In addition to the summary of responsibilities presented below, specific attendant duties are described in the appropriate parts of this document. Relevant duties are also discussed, as appropriate, during required training (see "[Training](#)").

Requirements

Attendants shall:

- Inform responding emergency personnel of hazards, safeguards, and other relevant information regarding planned entries.
- Maintain effective and continuous communication with entrants.
- Maintain visual contact with entrants, if feasible.
- Monitor activities inside and outside PRCSSs to determine if it is safe for entrants to remain within such spaces.
- Instruct entrants to evacuate PRCSSs immediately if entry conditions are judged unacceptable (based on the attendants experience and training).
- Maintain knowledge of applicable emergency response procedures.
- Summon rescue and other emergency services as soon as entrants need assistance to escape PRCSSs.
- Take the following actions, as appropriate, when unauthorized persons approach or enter a PRCSS:

- 
- Warn the unauthorized persons that they must stay away from the PRCS.
 - If the unauthorized persons have entered the PRCS, advise them that they must exit immediately.
 - Inform the entrants and the supervisor authorizing entry (SAE) if unauthorized persons have entered the PRCS.
- Perform no duties that might interfere with the primary duties of monitoring and protecting entrants.

General Responsibilities of Entrants

Note: In addition to the summary of responsibilities presented below, specific entrant duties are described in the appropriate parts of this document. Relevant duties are also discussed, as appropriate, during required training (see "[Training](#)").

Requirements



Entrants shall:

- Maintain communication with attendants during entry.
- Alert attendants when dangerous or prohibited conditions are detected.
- Exit PRCSs as quickly as possible when:
 - An order to evacuate is given by an attendant or supervisor authorizing entry (SAE).
 - An evacuation alarm is activated.
 - Dangerous or prohibited conditions are detected.




Hot Work Permits

Requirements

Entrants shall consult the [fire protection contact](#) to determine whether [hot work permits](#) are required prior to welding, cutting, burning, brazing, or other activities in a confined space. See [Section 4E](#), "Hot Work Safety," and [Chapter 5](#), "Fire Protection," for more information.


Atmospheric Monitoring

Supervisors authorizing entry (SAEs) shall ensure that:

- 
- Oxygen content, combustible concentrations, and concentrations of other potential atmospheric hazards, if warranted, are determined through atmospheric monitoring to be within acceptable limits prior to entry and for the duration of the entry.
 - When a confined space contains or has a potential to contain a [hazardous atmosphere](#), continuous monitoring of the atmosphere is performed for the duration of the operation while personnel are present within the space.
 - At SNL/CA, periodic monitoring is performed at a frequency necessary to ensure that acceptable entry conditions are being maintained. This frequency is determined by industrial hygiene personnel.

Ventilation

Supervisors authorizing entry (SAEs) shall ensure that:

- 
- A positive means of ventilating spaces is implemented at all times when work is in progress if a confined space contains or has a potential to contain a hazardous atmosphere.
 - When ventilation is used to control atmospheric contaminants in confined spaces, the spaces are ventilated until the atmosphere is within [acceptable entry reference levels \(AERLs\)](#).

Guidance

SAEs should ensure that positive ventilation is maintained for each confined space entry activity even under work conditions with a normal atmosphere.



*Emergency Notification, Response, and Rescue

Requirements

Managers in consultation with supervisors authorizing entry (SAEs) shall be responsible for ensuring that timely emergency response capability exists.

Note: At SNL/NM, the [site confined space rescue plan](#) is provided via this section and a condensed version is provided directly on the permit. For additional information when a specific rescue plan is necessary, consult the industrial hygiene representative on the appropriate [Division ES&H Team](#). At the time of permit registration, an electronic message is forwarded to the following emergency response personnel: Kirtland Air Force Base (KAFB) Fire Department and the SNL Emergency Operations Center. The permit acquisition process provides advance electronic notification to the rescue services. If rescue services are unavailable, SNL Emergency Management representatives will communicate the information to the supervisor authorizing entry.

Note: At SNL/CA, the generic site confined space rescue plan is provided on the permit. The need for a specific rescue plan for an entry will be determined by the industrial hygiene representative and the supervisor authorizing entry at the time permit is issued. Prior to entry, the supervisor authorizing entry or the industrial hygiene representative will notify the LLNL Fire Department Dispatcher, extension 22-7595, to confirm the availability of rescue services.

SAEs shall ensure:

- Availability of rescue services has been verified.
- A means to summon rescuers (e.g., telephone, cellular phone, two-way radio, etc.) is operable and readily available at the entry site.
- The following occur in the event of changes in job location or operating conditions (as described on relevant permits) or when emergencies arise:
 - Work ceases and personnel are removed from the confined space.
 - Work resumes only after a new permit has been obtained.
- Rescue procedures and emergency notification information is discussed with all



personnel associated with planned confined-space-related activities.

- Material safety data sheets (MSDSs) associated with chemicals used in a confined space are attached to the entry permit and are readily available to emergency response personnel.



Attendants shall **not** attempt to retrieve entrants from a confined space unless:

- The entrants are attached to retrieval lines.
- Retrieval is possible without additional help and does **not** require entry by the attendant.

Members of the Workforce shall perform extractions only when such actions can be accomplished from outside the confined space.

Note: All other rescue and emergency services are provided by the Kirtland Air Force Base Fire Department (at SNL/NM) or Lawrence Livermore National Laboratory Fire Department (at SNL/CA).

Personal Protective Equipment (PPE)



Requirements

Supervisors authorizing entry (SAEs) shall:

- In consultation with an industrial hygiene representative on the appropriate [Division ES&H Team](#), determine appropriate PPE.
- Ensure that PPE, if any, is specified on relevant permits.

Entrants shall use appropriate PPE based on a workplace assessment.

Guidance

Members of the Workforce should:



- Contact industrial hygiene representatives on the appropriate [Division ES&H Team](#) for assistance with workplace assessments and PPE selection.

- See [Section 4L](#), "Personal Protective Equipment (PPE)" for additional information.

Retrieval Equipment

Requirements

Supervisors authorizing entry (SAEs) shall determine appropriate retrieval equipment and methods. In addition, at SNL/CA, SAEs shall consult with industrial hygiene and safety engineering representatives on the appropriate [Division ES&H Team](#).

Entrants shall use appropriate retrieval equipment and methods as determined by the SAE.

Note: Typical retrieval equipment includes body harnesses, tripods, and winchers. Such equipment is available via the [confined space entry/equipment issuance contact](#).

ENTRY INTO NON-PERMIT CONFINED SPACES

Entry Evaluations

Requirements

Members of the Workforce who plan to enter a [non-permit confined space \(NPCS\)](#) shall do the following prior to [entry](#):

- Evaluate changes in the [confined space](#) since it was designated as an NPCS.
- Consult with the [space/equipment owner](#) to identify significant modifications/alterations to the space that could impact the classification, procedures for entry, or potential hazards.
- Consider other work being performed in the area that could change relevant entry procedures or the classification of the space, or that could otherwise adversely affect entry.

- Consider how work performed and materials used within the space could adversely affect entry.
- If any of the above conditions apply, notify an industrial hygiene representative on the appropriate [Division ES&H Team](#) for a re-evaluation of the space.

Obtaining Entry Checklists

Requirements

Members of the Workforce at SNL/CA shall **not** enter an NPCS until industrial hygiene personnel have completed an evaluation of the planned entry and issued a Non-Permit Confined Space Checklist (for an example, see Attachment 6I-3 [[Word file/Acrobat file](#)]).

Guidance

[Entrants](#) at SNL/NM should use SF 2001-CSG, Generic Non-Permit Confined Space Checklist ([Word file/Acrobat file](#)) prior to entering NPCSSs.

Standby Attendants or Radio Check-in

Requirements

Entrants shall ensure one of the following before entering non-permit confined spaces (NPCSSs):

- An [attendant](#) is on duty at the entry site.
- A procedure is established for radio check-in with cognizant personnel, to include a check-in frequency interval.

Atmospheric Monitoring and Ventilation

Guidance

Members of the Workforce should, prior to entering a non-permit confined space (NPCS), consult an industrial hygiene representative on the appropriate [Division ES&H](#)

[Team](#) for assistance with identifying monitoring and ventilation requirements.

Rescue

Requirements

Managers in consultation with entrants shall be responsible for ensuring that:

- Rescue procedures and equipment, which may include a [retrieval apparatus \(or system\)](#), are identified and provided as necessary to allow personnel to safely exit non-permit confined spaces (NPCSS).
- A means to summon rescuers (e.g., telephone, cellular phone, two-way radio, etc.) is operable and readily available at the entry site.

Managers at SNL/CA shall also consult industrial hygiene personnel when addressing the rescue-related requirements stated above.

Members of the Workforce shall perform extraction only when such actions can be accomplished from outside the confined space.

Note: All other entry rescue and emergency services are provided by the Kirtland Air Force Base Fire Department (at SNL/NM) or Lawrence Livermore National Laboratory Fire Department (at SNL/CA).

Guidance

Members of the Workforce should consult an industrial hygiene representative on the appropriate [Division ES&H Team](#) for assistance with identifying appropriate rescue equipment.

CONTRACTOR CONFINED SPACE ENTRY ACTIVITIES

Requirements



Managers shall be responsible for ensuring that [confined space entry](#) activities performed:

- Under the direction of facilities construction are governed by applicable provisions of the contract specifications.
- By outside contractor personnel are conducted under the direction of the Sandia Contract Representative (SCR) and Sandia Delegated Representative (SDR).

Guidance

Managers should ensure that the SDR:



- Identifies within the Statement of Work that confined space entry is involved in the contract.
- Consults with industrial hygiene personnel to identify general performance requirements, as well as requirements unique to specific operations or spaces, to identify appropriate rescue/responders, and to provide available information concerning confined space hazards.

Note: Hazard assessments beyond baseline conditions are not conducted by SNL for outside contractors. SNL provides the information required in 29 CFR 1910.146 (c)(8).

RELATED HAZARDS AND ACTIVITIES



Hazards and activities related to [confined space entry](#) include:

Hazard/Activity	Reference
Lockout/Tagout	Section 4C , "Lockout/Tagout (LOTO)"
Technical Work Documents (TWDs)	Chapter 21 , "Technical Work Documents (TWDs)"
Respiratory protection	Section 6C , "Respiratory Protection"

REFERENCES

Requirements Source Documents

[29 CFR 1910.146](#), *Permit-Required Confined Spaces*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

ANSI Z117.1-1995, *Safety Requirements for Confined Spaces*.

NIOSH, DHEW/PUB/NIOSH-80-106, *Criteria for a Recommended Standard - Working in Confined Spaces*, 1979.

NIOSH, DHHS/PUB/NIOSH-87-113, *A Guide to Safety in Confined Spaces*.

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ES&H Manual

SECTION 22A – ES&H LINE SELF-ASSESSMENT (SA) ACTIVITIES

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* Indicates a substantive change

- [Applicability](#)
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- [Retain Self-Assessment Records](#)

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APPLICABILITY

For purposes of this document Members of the Workforce are:

- Sandia [employees](#).
 - Sandia contractors as specified in [Section 1B](#), "What Is the Scope."
-

INTRODUCTION

Requirements and guidance for planning and conducting Line ES&H self-assessments (SAs) are provided. These SAs include the following activities:

- Identifying, communicating, and correcting performance or compliance issues.
- Observing, assessing, and improving work processes.
- Identifying [findings](#), [observations](#), [noteworthy practices](#), and Lessons Learned.

Line ES&H self-assessments SAs are only one of four components which make up ES&H SAs. This ES&H Manual section does **not** apply to the other three components of ES&H Self-Assessments SAs that are:

- ES&H Programmatic assessments conducted annually in accordance with ES&H and Emergency Management Center requirements.
- ES&H assessments of Line implementation requirements per the ES&H Manual/Program. These may be accomplished as part of ES&H Programmatic assessments, and can include site visits/field evaluations conducted by ES&H SMEs which are supported by the Line organizations.
- Independent assessments (e.g., internal assessments conducted by the ES&H Quality and Safeguards & Security Assessments department, Line-sponsored

independent assessment activities, ES&H SME assessments, etc.).

Compiling, tracking, and analyzing information gathered through all four of the above components of ES&H SAs provide the Line and policy owners an understanding of ES&H performance at Sandia National Laboratories.

TRAINING

Self-assessment (SA) training is required for all MOW who participate in SA activities. Each Division shall establish SA training appropriate to the specific Division SA process.

ROLES AND RESPONSIBILITIES

Requirements

Managers are required to have a thorough knowledge or technical understanding of the site's work planning and execution processes as described in the [Integrated Safety Management System \(ISMS\)](#) Sections 2.1.2, "Safety Management Functions" and 2.1.3, "Guiding Principles."

Note: Identification of unsafe work conditions or operations during the course of assessment activities shall result in the suspension of the activity and an immediate report to management.

Vice Presidents shall:

Ownership and Commitment

- Demonstrate ownership of ES&H SA activities by:
 - Integrating ES&H into overall mission performance.
 - Including SA activities in Vice President (VP) Action Plans and VP Performance Management forms (PMFs).

- Defining expectations for Division Line ES&H SA program.
- Driving cultural change by reinforcing expectations, demonstrating commitment to safety, rewarding performance, and establishing a presence in the workplace.
- Managing corporate issues in accordance with the [Corporate Issues Management Process](#).

Training

- Ensure SA training is identified and developed.
- Complete SA training as required.
- Ensure direct reports who participate in Line SA activities receive appropriate training.

Activities

- Review the ongoing analysis of Division SA activities in order to:
 - Establish content, number, and dates for the annual Division Line ES&H SA schedule.
 - Set SA performance goals.
- Ensure resources are available to perform SAs.

Communicate

- Communicate Division SA expectations to direct reports at the beginning of the performance year and encourage positive behavior and discernment of opportunities for improvement.
- Regularly communicate and report Division SA results to direct reports and Laboratory Leadership Team (LLT)
- Utilize [OOPS process](#) if significant safety issues are identified during SA.

Gather Self-Assessment Data

- Use the appropriate checklist(s) and perform SAs according to the established annual SA schedule.
- Document [findings](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- Document [observations](#) and [noteworthy practices](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.

Compile and Review Self-Assessment Data

- Use [metrics](#) to measure the effectiveness of the Integrated Safety Management (ISM) process.
- Analyze Division SA data.
- Review SA completion against Division performance goals.
- Identify systemic and recurring deficiencies.
- Review existing and historical findings to identify trends.
- Review lessons learned and identify [noteworthy practices](#).

Develop Corrective Actions

- Develop corrective actions (CAs) per [CPR001.3.11](#), *Corporate Corrective Action Process*.
- Ensure that the CAs taken are effective and efficient and verify appropriate involvement and implementation by MOW.

Center Directors shall:

Ownership and Commitment

- Demonstrate ownership of Center ES&H SA activities by:
 - Integrating ES&H into overall mission performance.

- Performing SA activities documented in Vice President (VP) Action Plans.
- Including ES&H ownership in their PMFs (and those of their direct reports).
- Developing a Center SA schedule in conjunction with senior managers.
- Defining expectations for the Center Line ES&H SA program.
- Driving cultural change by reinforcing expectations, demonstrating commitment to safety, rewarding performance, and establishing a presence in the workplace.
- Supporting ES&H assessments of Line implementation requirements per the ES&H Manual/Program.

Training

- Complete SA training as required.
- Ensure direct reports who participate in Line SA activities receive appropriate training.

Activities

- Analyze Center SA results in order to:
 - Establish content, number, and dates for the Center ES&H SA schedule.
 - Measure and set Center SA performance goals.
 - Determine systemic and cross-organizational issues.
- Ensure resources are available to perform SAs.

Communicate

- Communicate Center SA expectations to direct reports at beginning of the performance year and encourage positive behaviors and discernment of opportunities for improvement.
- Communicate Center SA results to the Division Vice President, peers and Center staff.

- Utilize [OOPS process](#) if significant safety issues are identified during SA.

Gather Self-Assessment Data

- Use the appropriate checklist(s) and perform SAs according to the established annual SA schedule.
- Identify deficiencies and, when appropriate, support “Just Do Its” .
- Document [findings](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- Document [observations](#) and [noteworthy practices](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.

Compile and Review Self-Assessment Data

- Use [metrics](#) to measure the effectiveness of the Integrated Safety Management (ISM) process.
- Analyze Center SA data.
- Review SA completion against Center SA performance goals.
- Identify systemic and recurring deficiencies.
- Review existing and historical findings to identify trends.
- Review lessons learned and identify [noteworthy practices](#).

Develop Corrective Actions

- Develop CAs per [CPR001.3.11](#), *Corporate Corrective Action Process* .
- Make resources available to ensure CAs are completed on time.
- Ensure CAs are implemented effectively and efficiently and verify appropriate involvement and implementation by MOW.
- Validate that CAs previously implemented have corrected the deficiency and that the CA remains effective.

Senior Managers shall:

Ownership and Commitment

- Demonstrate ownership of organization ES&H SA activities by:
 - Integrating ES&H into overall mission performance.
 - Establishing an organization SA strategy, based on the annual Center SA expectations.
 - Including ES&H ownership in PMFs (in their own and those of their direct reports).
 - Defining expectations for the organization's Line ES&H SA program.
 - Driving cultural change by reinforcing expectations, demonstrating commitment to safety, rewarding performance, and establishing a presence in the workplace.
 - Supporting ES&H assessments of Line implementation requirements per the ES&H Manual/Program.

Training

- Complete SA training as required.
- Ensure department managers who participate in Line SA activities receive appropriate training.

Activities

- Perform assigned SAs per Center ES&H SA schedule.
- Analyze organization SA results in order to:
 - Measure and set the organization's SA performance goals.
 - Determine systemic and cross-organizational issues.
- Ensure resources are available to perform SAs.

Communicate

- Communicate SA expectations to direct reports at beginning of the performance year and encourage positive behavior and discernment of opportunities for improvement.
- Interact with MOW in a coaching manner.
- Communicate SA results to Center Director, peers, direct reports and staff.
- Utilize [OOPS process](#) if significant safety issues are identified during SA.

Gather Self-Assessment Data

- Use the appropriate checklist(s) and perform SAs according to the established annual SA schedule.
- Identify deficiencies and, when appropriate, support “Just Do Its.”
- Document [findings](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- Document [observations](#) and [noteworthy practices](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.

Compile and Review Self-Assessment Data

- Use [metrics](#) to measure the effectiveness of the Integrated Safety Management (ISM) process.
- Analyze organization SA data.
- Identify systemic and recurring deficiencies.
- Review existing and historical findings to identify trends.
- Review lessons learned and identify [noteworthy practices](#).

Develop Corrective Actions

- Develop CAs per [CPR001.3.11](#), *Corporate Corrective Action Process* .
- Make resources available to ensure CAs are completed on time.
- Ensure CAs are implemented effectively and efficiently and verify appropriate involvement and implementation by MOW, interacting with MOW in a coaching manner as needed.
- Validate that CAs previously implemented have corrected the deficiency and that the CA remains effective.

Managers shall:

Ownership and Commitment

- Demonstrate ownership of department's ES&H SA activities by:
 - Integrating ES&H into overall mission performance.
 - Performing SAs per the established organization SA strategy and based on the annual Center SA expectations.
 - Including ES&H ownership in PMFs (their own and their direct reports).
 - Defining expectations for the department's Line ES&H SA program.
 - Driving cultural change by reinforcing expectations, demonstrating commitment to safety, rewarding performance, and establishing a presence in the workplace.
 - Supporting ES&H assessments of Line implementation requirements per the ES&H Manual/Program.

Training

- Complete SA training as required.
- Ensure MOW who participates in Line SA activities receive appropriate training.

Activities

- Perform assigned SAs per Center ES&H SA schedule.
- Analyze department SA results in order to:
 - Measure and set department SA performance goals
 - Determine systemic and cross-department issues.

Ensure resources are available to perform SAs.

Communicate

- Communicate SA expectations to direct reports at the beginning of performance year and encourage positive behavior and discernment of opportunities for improvement.
- Interact with MOW in a coaching manner.
- Communicate SA results to Senior Manager, peers, and staff.
- Utilize [OOPS process](#) if significant safety issues are identified during SA.

Gather Self-Assessment Data

- Use the appropriate checklist(s) and perform SAs according to the established annual SA schedule.
- Identify deficiencies and, when appropriate, support “Just Do Its.”
- Document [findings](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- Document [observations](#) and [noteworthy practices](#) for all phases of work and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.

Compile and Review Self-Assessment Data

- Use [metrics](#) to measure the effectiveness of the Integrated Safety Management (ISM) process.
- Analyze department SA data.

- Identify systemic and recurring deficiencies.
- Review existing and historical findings to identify trends.
- Review lessons learned and identify [noteworthy practices](#).

Develop Corrective Actions

- Develop CAs per [CPR001.3.11](#), *Corporate Corrective Action Process* .
- Make resources available to ensure CAs are completed on time.
- Ensure CAs are implemented effectively and efficiently and verify appropriate involvement and implementation by MOW, interacting with MOW in a coaching manner as needed.
- Validate that CAs previously implemented have corrected the deficiency and that the CA remains effective.

Members of the Workforce shall:

Ownership and Commitment

- Demonstrate commitment to department ES&H SA activities by:
 - Integrating ES&H into overall mission performance.
 - Performing, as assigned, SAs per the established department SA strategy and based on the annual Center SA expectations.
 - Including ES&H ownership in their PMFs.
 - Driving cultural change by meeting management's safety expectations.
 - Supporting ES&H assessments of Line implementation requirements per the ES&H Manual/Program.

Training

- Complete appropriate SA training, as assigned by management

Activities

- Perform assigned SAs per Center ES&H SA schedule.
- Keep work activities/space assessment ready.
- Seek guidance, as needed, from SMEs and other corporate resources.

Communicate

- Communicate SA results to management and peers.
- Consult with management to determine when to utilize [OOPS process](#) if significant safety issues are identified during SA.

Gather Self-Assessment Data

- Use the appropriate checklist(s) and perform assigned SAs according to the established annual Line ES&H SA schedule.
- Document concerns/problems, opportunities for improvement, and [noteworthy practices](#) for all phases of work and report them to management.
- When appropriate, support “Just Do Its.”

Compile and Review Self-Assessment Data

- Look for underlying issues.

Develop Corrective Actions

- Take actions on minor issues in real time – “Just Do It.”
- Participate in [causal analyses](#) on findings as appropriate, per [CPR001.3.11](#), *Corporate Corrective Action Process* .
- Support the implementation of CAs, as appropriate.
- Support the validation of previously implemented CAs as appropriate, to ensure the deficiency has been corrected and the CA remains effective.

LINE SELF-ASSESSMENT PROCESS

The following are the basic steps for conducting ES&H SAs at Sandia:

- Define expectations.
 - Schedule the SA.
 - Plan the SA.
 - Gather SA data.
 - Compile and review SA data.
 - Develop corrective actions.
 - Report SA results.
 - Use SA results.
-

DEFINE EXPECTATIONS

Vice Presidents shall establish expectations for Division Line ES&H SA performance. The expectations are based upon a review of the results of the Division's previous years' ES&H performance and SA data. Vice Presidents shall ensure that expectations for SAs are communicated through all levels of the organization; shall make resources available to perform SAs; and shall establish performance goals and [metrics](#).

SCHEDULE THE SELF-ASSESSMENT

Vice Presidents shall perform a critical review of the analyses of previous years' SA reports as input for establishing their annual SA schedule. The corporate SA schedule shall include Division self-assessments that are ES&H focus areas and the timetable established for their completion.

Directors and Senior Managers shall critically review the previous years' findings and corrective actions in order to set the Center business priorities. This information shall be used to set the content and number of organizational SAs. The Center SAs combined with any corporate-directed SAs comprise the annual SA schedule for the Center and shall be submitted to the Division Vice President for approval. Division Vice Presidents shall submit their Division annual SA schedule to the Vice President of Corporate Transformation.

Note: Radiological activities are assessed, at a minimum, every 3 years in accordance with CPR400.1.1.32/ [MN471016](#), *Radiological Protection Procedures Manual*, Chapter 13, "Feedback and Improvement," [Section 4.0](#).

PLAN THE SELF-ASSESSMENT

The planning of an organization's SAs activities begins with the establishment of the annual schedule.

Planning includes:

- Identification of the space and/or activity to be assessed.
- Identification of management and if appropriate, MOW who will perform the assessments.
- Date the assessment is to be conducted.
- Review of documentation prior to the assessment. These documents should include, but are not limited to:
 - [Primary hazard screenings \(PHSs\)](#) and applicable authorization basis documents.
 - Past self-assessments and corrective actions.
 - Applicable technical work documents (TWDs).
 - Training records.

- Performance requirements and expectations.
 - Results of applicable ES&H Programmatic SAs.
 - Selection of tools over and above a checklist, if required.
 - [Verification](#) and/or [validation](#) of corrective actions from previous findings.
-

GATHER SELF-ASSESSMENT DATA

Performing a SA requires collecting information and/or evidence to determine if ES&H performance meets requirements and corporate expectations. Sufficient information and evidence shall be gathered in order to validate conclusions and report results.

A [generic checklist](#) has been created that can be used by the line to assist the assessor with the evaluation of ES&H performance in a specific focus area. These checklists are meant to be filled in with applicable requirements and the expectations being assessed. Use of the generic checklist is not mandatory but can save the Line considerable effort in creating a checklist for each SA.

- [Findings](#) for all phases of work shall be documented and addressed per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- [Observations](#) and [noteworthy practices](#) shall be documented for all phases of work and addressed per [CPR001.3.10](#), *Corporate Self-Assessment Process*.

Each time a SA has been completed an electronic record shall be created in the [Laboratory Enterprise Self-assessment \(LESA\) application](#). At a minimum, the following information shall be compiled and entered into [LESA](#).

- Describe:
 - Who conducted the self-assessment,
 - When the self-assessment was conducted,
 - What was assessed (facility/operation).

The following information can either be entered into the checklist or input into [LESA](#):

- [Lessons Learned](#), if applicable.
- Verification information.
- Validation information.

Management should consider including a list of checklists used, documents reviewed and any MOW involved in the self-assessment.

Note: Potential non-conformances with nuclear safety requirements or worker safety and health requirements shall be reported to the Safety and Security Regulatory Support Office see [Section 18G](#), "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances." Issues are identified and reported up the management chain per [CPR001.3.9](#), *Corporate Issues Management Process*.

- Identification of unsafe work conditions or operations during the course of assessment activities shall result in the suspension of the activity and an immediate report to management. Management will determine when to utilize the [OOPS process](#).

*COMPILE AND REVIEW SELF-ASSESSMENT DATA

Self-assessment results shall be compiled and reviewed per the process outlined in the heading "Compile and Review SA Data" listed under [Roles and Responsibilities](#) of the *ES&H Manual* Section.

The ES&H Performance Assurance Department shall:

- Analyze the ES&H SA data from a corporate perspective to identify trends or issues.
- Compare the above analysis to the analyses of ES&H programmatic SAs to determine if there are any gaps, discrepancies, trends or issues.

- Document [findings](#) and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- Document [observations](#) and [noteworthy practices](#) and address them per [CPR001.3.10](#), *Corporate Self-Assessment Process*.
- Generate a report of the reviewed results.
- Present results to the ES&H Issues Management Review Council (IMRC).

IMRC will forward potential trends to the ES&H Issues Council with recommendation(s) for action.

DEVELOP CORRECTIVE ACTIONS

Corrective actions (CAs) are developed per [CPR001.3.11](#), *Corporate Corrective Action Process*.

The owning manager shall assign an owner for each CA. The owner will identify the resources necessary to complete the CA and once completed, the owner shall verify CA completion, communicate to upper management, and validate the CA effectiveness.

REPORT SELF-ASSESSMENT RESULTS

Self-assessment results shall be reported from departments to centers and from centers to divisions as outlined in the heading “Communicate” listed under [Roles and Responsibilities](#) of this *ES&H Manual* Section.

Self-assessment results, [causal analyses](#), corrective actions, Lessons Learned, and [noteworthy practices](#) shall be communicated to the MOW to improve mission performance.

Note: Management shall review the SA data and report into other corporate process/systems (e.g., RPIR, ORPs) as required in [Chapter 18](#), “Reporting, Investigating, and Correcting ES&H Events” of the *ES&H Manual*.

USE AND TREND SELF-ASSESSMENT RESULTS

Results from the review of the previous year's data will be used to:

- Improve the work environment
- Assist with establishing a schedule and identifying the focus areas that should be assessed in the upcoming year.
- Provide trending data to determine if ES&H performance has met expectations.
- Assist with improving overall mission performance.

Division management shall present results and recommendations for corrective actions (if necessary) to the Division Vice President.

LESSONS LEARNED

[Lessons Learned](#) shall be developed and input into the corporate lessons learned program, shared within organizational staff meetings, and used for continuous improvement of work planning and control.

RETAIN SELF-ASSESSMENT RECORDS

Assessment records shall be retained per [CPR400.2.20](#), "Records Retention and Disposition Schedule and Process." Most ES&H documentation must be retained for 10 years, per [CP-102-212-000](#), "ES&H and Quality Assessments Records" but longer retention periods may apply. SA records must be submitted by the assessor to the ES&H and Security Records Center.

REFERENCES

Requirements Source Documents

[DOE O 226.1](#), Implementation of Department of Energy Oversight Policy, 9/15/05.

[DOE O 413.1A](#), Management Control Program, 4/18/02.

[DOE O 450.1](#), Environmental Protection Program, Chg. 2, 12/17/05.

[DOE 5480.19](#), Conduct of Operations Requirements for DOE Facilities, Chg. 2, 10/23/01.

Management and Operating Contract Between Sandia Corporation and DOE DE-AC04-94AL85000, Section H Special Contract Requirements, [H-3 Contractor Assurance System](#).

[Sandia National Laboratories Contractor Assurance System Description](#) SAND2004-0350P.

Related Documents

[CPR001.3](#), *Price-Anderson Amendments Act (PAAA) Nuclear and Worker Safety Requirements*.

[CPR001.3.2](#), *Corporate Quality Assurance Program*.

[CPR001.3.3](#), *Formality of Operations Manual*.

[CPR001.3.4](#), *The Corporate Work Process (CWP)*.

[CPR001.3.5](#), *Audits*.

[CPR001.3.9](#), *Corporate Issues Management Process*.

[CPR001.3.10](#), *Corporate Self-Assessment Process*.

[CPR001.3.11](#), *Corporate Corrective Action Process* .

[DOE O 414.1C](#), *Quality Assurance*.

[DOE G 450.4-1B](#), *Integrated Safety Management System Guide*.

[PLA 04-12](#), *ES&H & Emergency Management Functional Area Self-Assessment Plan*.

Environmental Safety and Health Self-Assessment Process.

Lockheed-Martin Corporation, *Environment Safety and Health Process*.

Corporate Functional Procedure No: ESH-10

Effective: 03/31/05

Revision: 1



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ES&H Manual

*SECTION 13A – HAZARDS IDENTIFICATION AND CLASSIFICATION PROCESS

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*Indicates a substantive change

- [Applicability](#)
- [Training](#)
- [*Hazards Identification and Management](#)
- [Integrated Safety Management System \(ISMS\) Software](#)
- [Preparation, Maintenance, and Review of Primary Hazard Screenings \(PHSs\)](#)
- [Safety Documentation](#)
- [Readiness Reviews](#)
- [Hazard Aggregation Rollup Process \(HARP\)](#)
- [Records](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - [13A-1](#) - Hazard and Risk Management Process Flow
 - [13A-2](#) - Flowdown of Chapter 13 Hazard and Risk Management Processes from ISMS
 - [13A-3](#) - PHS/HA Reviewer Tool
 - [13A-4](#) - HARP Criteria



APPLICABILITY

For purposes of this document Members of the Workforce are:



- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce performing activities on [Sandia-controlled premises](#) and mission activities on non-Sandia-controlled premises unless otherwise directed in the *ES&H Manual*, [Section 1B](#).

This section does **not** apply to contracts for products or services or vendor-owned equipment in which Members of the Workforce are not directly engaged in the contracted work activity.

Note: The Hazard Identification and Classification Process is organized to reflect the Integrated Safety Management System (ISMS) model, as illustrated in the following:

- [Attachment 13A-1](#), "Hazard and Risk Management Process Flow," shows the flow of specific requirements described in Sections 13A through 13D.
- [Attachment 13A-2](#), "Flowdown of Chapter 13 Hazard and Risk Management Processes from ISMS," identifies the four major steps that comprise the ISMS process and shows how they flow from ISMS.

TRAINING

Work Activity or Role	Required	Recommended
Using the Integrated Safety Management System (ISMS) Software :		
ES&H Coordinators	ISMS100	N/A
PHS/HA authors	N/A	ISMS100
HARP authors	ISMS100	N/A

Approving managers

N/A

[ISMS100](#)

*HAZARDS IDENTIFICATION AND MANAGEMENT

Requirements

Managers shall be responsible for ensuring the following prior to the start of any new work (projects, activities, etc.):

- Hazards are identified, analyzed, and controlled to minimize adverse consequences, and the likelihood of adverse consequences.
- Hazards identifications, analyses, and emergency plans are current, and all hazard controls are in place and operational.

Note: This may include implementing safe and effective temporary compensatory measures and hazard controls until permanent hazard controls and final abatement actions are in place or completed.


- Members of the Workforce are informed of the hazards and hazard controls applicable to the activity in which they are involved.

- Identified risks are acceptable.
- The following have been completed:
 - Authorization Basis requirements (see [Section 13C](#), "Authorization Basis Process").
 - Readiness Review requirements (see [Section 13D](#), "Readiness Review Process - Planning, Review and Approval").

Members of the Workforce shall use the [Integrated Safety Management System \(ISMS\) Software](#) to:

- Identify and document the following for all [operations](#):


- Hazards.
- [Facility](#)/project designator (e.g., accelerator, nuclear, radiological facility).
- Hazards classification (e.g., business occupancy [office], standard industrial, category 3 nuclear).
- Training requirements.
- Safety documentation.



● Document the analysis of hazards for low-hazard industrial operations. At a minimum, for each hazard analyzed, the analysis shall include the potential causes for the hazard, the potential consequences caused by the hazard, the controls to be implemented to control the hazard, and an assessment of the sufficiency of the controls in controlling the hazard.

Note: The hazard analysis may be performed and addressed in another document that is referenced in the Hazard Analysis section of the ISMS software. However, any referenced analysis must be at least as rigorous as that required by the ISMS software. The referenced document must contain at least the same information and level of detail as required for the ISMS software.

- For moderate- and high-hazard industrial operations, [accelerators](#), and [nuclear facilities](#), identify the specific applicable safety basis document (e.g., safety assessment document, documented safety analysis).



Note: For moderate- and high-hazard industrial operations, accelerators, and nuclear facilities, the ISMS software will address those low hazards that are not analyzed in the more rigorous safety documentation.

Members of the Workforce who direct or supervise day-to-day operations and activities shall:

- Know the hazards associated with the work/[workspace](#) and the controls needed to perform the work safely that are outlined in the [Primary Hazard Screening \(PHS\)](#).
- For compliance purposes, integrate all Sandia ES&H requirements, which includes corporate (e.g., the *ES&H Manual*), facility-specific (e.g., standard operating procedures), and project-specific (e.g., equipment manuals, job aides) requirements.
- Ensure that all required controls are properly in place before work begins [and during work](#).



- Report to management if any work situations or practices are observed, which do not comply with safety responsibilities as outlined in *ES&H Manual*, [Attachment 1D-1](#), "Suspending and Resuming Work."

When determining controls to mitigate hazards, managers and Members of the Workforce shall:

- Eliminate hazards or reduce risk through design.
- Use the following hierarchy for mitigating hazards:
 1. Passive engineering controls.
 2. Active engineering controls.
 3. Administrative controls.
 4. Personal protective equipment.
- Implement interim protective measures pending completion of actions to implement final abatement (mitigation) of hazards.
- Consider the following, when establishing interim controls:
 1. In the interval during which an abatement action is being carried out, interim protective measures are established for identified hazards. Methods such as administrative controls, work practice modifications, or personal protective equipment may be used to provide this interim protection. The interim measures selected provide protection that is equivalent to the permanent protection provided by compliance with relevant safety standards.
 2. The determination of priority assigned to the abatement of a specific hazard shall be based on the risk of injury or illness the hazard presents to the worker; however, other factors may be considered, including: regulatory compliance; resources (budget and personnel); complexity of abatement; and mission. In some cases, it may be appropriate to address lower-level hazards before higher level hazards if quick abatement is possible and effective interim protection is in place to provide protection until the final abatement action can be implemented. For example, for a one-time only work activity with a hazard for which an engineering solution would require extensive resources, an interim abatement action for the hazard without follow-through to perform the engineering action would be appropriate.



Guidance

Members of the Workforce should mitigate risk by:

- Isolating hazardous substances, components, and operations.
- Locating equipment so that exposure of Members of the Workforce to hazards is minimized.
- Minimizing risks associated with process conditions (e.g., temperature, pressure, noise, toxic material exposure, acceleration).
- Designing systems to minimize the impact of human error on the operation and capability of the systems.
- Considering design improvements to minimize risk from hazards that cannot be eliminated. Such approaches include methods and equipment designed to interrupt, terminate, or redirect an operational occurrence or an accident event sequence, such as interlocks, redundancy, fail-safe design, system protection, material substitution, secondary containment, or fire suppressors. The facility and system design should effectively incorporate all safety requirements.
- Considering secondary initiators of hazardous events, such as loss of power, cooling, exhaust, or one or more process material or control conditions, and providing methods to minimize the consequences of such events.
- Protecting the power source, controls, and critical components of redundant subsystems by physical separation and shielding.
- Designing software-controlled or software-monitored functions to minimize initiation of hazardous events or mishaps.
- Reviewing design criteria for inadequate or overly restrictive requirements regarding safety.

Members of the Workforce should do the following when design improvements cannot adequately reduce risk:

- Incorporate and provide periodic functional checks of safety devices such as:
 - Passive safety design features or devices (e.g., a fire barrier or a radiation barrier).

- Active safety design features or devices (e.g., a fire suppression system or a nuclear reactor control system).

- Provide warning devices to detect and alert Members of the Workforce of hazards and provide periodic functional checks of warning devices.
- Develop procedures and training to reduce associated risks through safety and warning devices. Procedures may include the use of personal protective equipment (PPE) and monitoring devices.
- Provide warning and caution notes in instructions and procedures, and include distinctive markings on hazardous components and material, equipment, and facilities.

Members of the Workforce should provide contingency plans and procedures to:

- Mitigate the consequences of hazards that cannot be eliminated through design approaches.
- Minimize the severity of personnel injury or damage to systems, components, structures, material, product, and programmatic capability.

Members of the Workforce should consult their [Division ES&H Team](#) for additional guidance and assistance.

INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) SOFTWARE

Part of the ISMS process at Sandia is to identify and analyze hazards to ensure Members of the Workforce are **not** exposed to an unacceptable level of risk when performing their duties. Sandia management has developed [ISMS software](#) to assist Members of the Workforce with this task. The primary module of the ISMS software is the [primary hazard screening \(PHS\)](#) with integral [hazards analysis \(HA\)](#). The [PHS](#) identifies hazards and captures limited work controls for the hazards. The [HA](#) analyzes hazards using a modified failure modes and effects analysis (FMEA) to document the analysis and mitigation.

The PHS module output of the ISMS software documents the following aspects of the ISMS process:

- Hazard identification.
- Operation type.
- Required actions.
- Training requirements
- Action and warning messages.
- Applicable Sandia requirements documents (e.g., *ES&H Manual*).
- Hazard classification into one of the following categories:
 - [Business Occupancy \(Office\)](#).
 - [Standard industrial hazard \(SIH\)](#).
 - [Low-hazard industrial](#).
 - [Moderate-hazard industrial](#).
 - [High-hazard industrial](#).
 - [Accelerator](#).
 - [Category 3 nuclear](#).
 - [Category 2 nuclear](#).

Requirements

Managers who plan to develop or modify [operations](#) that would result in a moderate- or high-hazard industrial, [accelerator](#), or a hazard category 1, 2, or 3 DOE nuclear [facility](#) classification shall consult the [Safety Basis Department](#) for assistance during the early planning stages.

Note: The PHS process can be used to supplement hazard documentation for moderate- or high-hazard industrial operations, accelerators, or hazard category 1, 2, or 3 DOE nuclear facilities. However, it does **not** specifically address hazard category 1 DOE nuclear facility classifications at this time because no Sandia-controlled premises meet the criteria for these

types of classifications.

Managers of moderate-hazard industrial operations, accelerators, or hazard category 2 or 3 DOE nuclear facilities shall ensure that their safety documentation for these operations are reviewed by Safety Basis Department personnel to ensure proper hazard classification and analysis.

Guidance

Members of the Workforce can use the PHS module of the ISMS software as a project planning tool by manipulating the answers to the various questions in the PHS interview and then recalculating results to examine the effects of hazard reduction or elimination on the project cost and schedule. However, these tests in the PHS system should be marked as such in the title section of the module.

PREPARATION, MAINTENANCE, AND REVIEW OF PRIMARY HAZARD SCREENINGS (PHSs)

Requirements

Managers who are in charge of [operations](#) shall be responsible for ensuring that:

- They are knowledgeable of the hazards and operations covered by the analyses (e.g., via work process knowledge, briefings, walkdowns).
- All operations are covered by [PHSs](#).
- PHSs are developed by Members of the Workforce who are familiar with the respective hazards.
- All hazards under the scope of a PHS are identified in the PHS.
- Hazards that are not adequately identified in the answers to PHS questions are identified in the “Other Hazards” question.

Note: A completed PHS represents the hazards posed by the operation as a whole. The absence of a PHS question that directly identifies a hazard does not alleviate the responsibility to identify that hazard.

- Members of the Workforce whom they direct and their [Division ES&H Team](#) are encouraged to assist with identifying hazards and preparing PHSs.
- PHSs bound operational hazard conditions that are present within an operation.

Note: This is the [safety envelope](#) for the operation.

- Members of the Workforce who are subject to required training as specified in PHSs are identified.

Note: The [PHS](#) module of the [Integrated Safety Management System \(ISMS\) Software](#) generates lists of required training courses based on the potential hazards identified during development of PHSs. When training is not immediately available, managers may issue [exceptions](#) from required training based on an equivalency basis or individual job function (see *ES&H Manual*, [Chapter 11, "Guidance,"](#) under "Corporate-, Program Owner-, and Organization-Managed ES&H Training"). Exceptions are noted in the description field of the PHS.

- Required training courses are communicated to affected members of their department and to the managers of any matrixed or [roving personnel](#).

Note: See "Roving Personnel and Visitors" in *ES&H Manual*, [Section 1D](#), "Who Does What," for related requirements affecting persons who have **not** received Sandia (or equivalent) training.

- Required training courses and records of their completion are entered into the corporate training database (i.e., Training Education and Development System [TEDS]) for their personnel (see *ES&H Manual*, [Chapter 11](#), "ES&H Training," for more information.)


- All personnel (employees, Sandia-directed contractors, and visitors) who need training are trained prior to performing work.

- Untrained personnel are prevented from doing work for which pre-job training is required.

- PHSs are updated:

- Annually (**not** to exceed 12 months, except as specified in the note below).


Note: A current PHS is considered valid for up to 45 additional calendar days if the updated PHS is in the review cycle prior to the 12 month expiration date. In



some extenuating circumstances when a PHS cannot be completed within the annual update timeframe, an exception or an extension may be granted, in writing, by the Safety Basis Department manager. This is granted on a case-by-case basis only. Consult the [PHS contact](#) in the Safety Basis Department for information.

- As necessary to reflect significant changes (e.g., increases in hazardous material inventories, introduction of additional hazards).
- When a change is planned that falls outside the safety envelope described in the original PHS.

Note: Using the "Rollover" function within the PHS module of the ISMS software (see the [ISMS Software website](#)) can simplify the PHS update and will ensure that the latest PHS questions are considered. However, with modifications that are made to the PHS module, managers should be aware that not all answers will be transferred over and should check the results before submitting the PHS.



- Current approved PHSs are retained and are made available for DOE review upon request.

- Assist ISMS software personnel in conducting field verifications of PHSs, as requested.
- PHSs must be updated and approved when changes are made to the operation that would involve altering any of the answers to the electronic version of the PHS questions.

Note: Minor administrative changes (e.g., typos) may be made without re-review and approval of the PHS.

Managers shall electronically sign PHSs to indicate their approval. This approval means:

- PHSs are accurate and complete and any additional documentation that may be necessary has or shall be completed.



- Resources shall be made available to appropriately mitigate hazards.

Note: While completion of the PHS/HA document is an integral step in the ISMS process, it does **not** complete the ISMS process. Output from the PHS/HA may be used to facilitate the completion of the ISMS process including:

- Analyzing hazards to process level.

- Establishing specific controls.
- Developing needed work control documents.
- Completing action items.
- Establishing training requirements for individual Members of the Workforce.
- Assuring all applicable requirements are met.

Members of the Workforce who author or update PHSs shall:

- Be knowledgeable of related hazards and operations

Note: There may be legacy hazards from previous operations which are considered if they are still appropriate.

- Consult ES&H coordinators, the appropriate [Division ES&H Team](#), SMEs, and other Members of the Workforce who perform operations covered by PHSs, as appropriate.
- For operations with nuclear material, apply the concept of independent [nuclear facilities \(segmentation\)](#) where [facility](#) features preclude bringing material together or causing harmful interaction from a common severe phenomenon.
- Use the PHS module of the ISMS software (see the [ISMS Software website](#)) and enter all required information (i.e., fill in the following screens):
 - "General Information"
 - "PHS Locations"
 - "Permits"
 - "Documents"
- Use and answer the latest authorized question set(s) available at the time of the preparation or update.

Note: A change in the PHS question set does **not** require that a PHS be immediately updated unless specifically notified by the [PHS contact](#) in the Safety Basis Department.

- Answer all PHS interview questions, when applicable.

Note: All PHS question sets are documented in administrative operating procedures (see the [ISMS Software website](#)).

- Enter a description of the operations covered by the PHS.

Note: The description should be in sufficient detail to allow reviewers to understand the hazards identified by the PHS. The description should contain enough information to provide a reader who is not familiar with the operations a general idea of the type and scope of activities that are conducted in performing the work covered in the PHS.

- Reference related PHS documents in the PHS references field.
- Ensure that if the operation is classified as a Standard Industrial Hazard (SIH), this classification is only used for hazards that can affect the workers involved in a specific activity only and do not have the potential to cause injury to collocated workers involved in other activities.
- Enter any Sandia-offered training beyond the system-generated required courses that managers require for their personnel (employees, Sandia-directed contractors, and visitors) in the "Manager Specified Courses" table of the PHS.
- Enter any required training that is **not** Sandia-offered training (e.g., equipment-specific training, on-the-job training, or an ES&H SOP training package) in the "Manager Specified Other Courses" table of the PHS.
- Include notes, where appropriate.
- Enter all radioactive material that could potentially be in inventory.


Note: The amount of radioactive material listed in the radionuclides table in the PHS constitutes the approved operating envelope for radioactive material associated with the PHS. A list of applicable radioactive material thresholds and the procedure to calculate a sum of ratios is located in [DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, Attachment 1, "Hazard Categorization of DOE Facilities."

- Update the PHS if the hazards change (e.g., if radioactive material quantities are to be exceeded) prior to performing work under the new PHS.
- Notify the appropriate ES&H coordinator for technical review and electronic signature.
- Obtain electronic signatures from approving managers.

- If required, obtain electronic signatures from concurring safety reviewers (e.g., radiation protection SME, explosives SME, safety basis SME).
- Notify the [PHS contact](#) in the Safety Basis Department for quality review and electronic signature.

Note: The quality review will follow the process outlined in [Attachment 13A-3](#), "PHS/HA Reviewer Tool."


ES&H coordinators shall:

- 
- Assist Members of the Workforce in completing PHSs if requested to do so.
 - Review PHSs for technical accuracy.

Note: Technical reviews help ensure that PHSs are technically correct and that all hazards have been identified. These reviews may include walk-downs by ES&H coordinators and other members of [Division ES&H Teams](#). A tool to assist in reviewing PHS/HA documents is located in *ES&H Manual*, [Attachment 13A-3](#) "PHS/HA Reviewer Tool."

- Electronically sign PHSs.
- Brief approving managers, if necessary, before the managers sign PHSs.

Guidance



Managers new to an organization should read all PHS documents associated with their operations.

Managers may combine multiple operations into a single PHS when the affected work activities involve the same type of operations and potential hazards. Conversely, a single operation may be covered by multiple PHS documents. In that case, the related PHS documents are referenced in the PHS reference field.

Managers and Members of the Workforce who prepare or approve PHSs should:

- Do the following if they need assistance with the PHS module of the ISMS software:
 - Call the [Corporate Computing Help Desk \(CCHD\)](#) if there are problems starting



the program.

- Contact the [ISMS Software Helpline](#) for all other problems.
- Attend the [ISMS100](#) Software training course.
- Do the following when authoring a PHS:
 - Take into consideration the effect or impact of any adjacent hazards (i.e., nearby operations that may be covered in a separate PHS).
 - In situations where Sandia is **not** the primary contractor (e.g., at the Waste Isolation Pilot Plant [WIPP]), address only those hazards to which Members of the Workforce will be exposed. The PHS description should include Sandia's scope of action and interfaces with the prime contractor.
 - Consult the appropriate [Division ES&H Team](#) to resolve questions concerning PHS module output from the ISMS software.
 - List Members of the Workforce who participated in the preparation of PHSs.



SAFETY DOCUMENTATION


Requirements

Note: For the [Business Occupancy \(Office\)](#) classification, no additional safety documentation is required beyond the [Primary Hazard Screening \(PHS\)](#).

Managers shall be responsible for ensuring that additional safety documentation (as indicated by the PHS module output) is prepared and completed as follows:

- For Standard Industrial Hazard (SIH) [operations](#), an [SIH review \(SR\)](#) report must be completed prior to the start or restart of operations (see *ES&H Manual*, [Section 13D](#), "Readiness Review Process - Planning, Review and Approval").
- For [low-hazard industrial operations](#):
 - Members of the Workforce who are familiar with the potential hazards in those operations complete the integral [Hazards Analysis \(HA\)](#) section of the [PHS](#) (see


ES&H Manual, [Section 13B](#), "Hazards Analysis Process").

- 
- Ensure an ES&H Coordinator completes a [low-hazard review \(LR\)](#) report prior to operations (see *ES&H Manual*, [Section 13D](#), "Readiness Review Process - Planning, Review and Approval").
 - If the PHS module output indicates that the operation is a [moderate-hazard industrial](#), nuclear, or [accelerator facility](#), Members of the Workforce who are familiar with the potential hazards in those facilities complete additional safety documentation according to the hazards classification, as indicated by the PHS module output (see *ES&H Manual*, [Section 13C](#), "Authorization Basis Process").
 - If the PHS module output indicates that a [hazards assessment document \(HAD\)](#) or emergency planning hazards assessment (EPHA) for emergency planning may be required, Members of the Workforce who are familiar with the respective hazards should consult the [emergency response planning contact](#) for documentation requirements.
 - If the PHS module output indicates that a National Environmental Policy Act (NEPA) review may be required, Members of the Workforce who are familiar with the respective hazards consult a [NEPA specialist](#) for documentation requirements.
 - If the PHS module output indicates that other documents are required [e.g., [technical work documents \(TWDs\)](#)], Members of the Workforce who are familiar with the respective hazards complete the specified documents.

Note: TWDs are to be written and approved in accordance with *ES&H Manual*, [Chapter 21](#), "Technical Work Documents (TWDs)."

Guidance

Members of the Workforce should consult the following, as appropriate, when completing safety documentation other than [PHSs](#)

- 
- *ES&H Manual*, [Section 13C](#), "Authorization Basis Process."
 - CPR400.1.1.20/[GN470088](#), *Preparation and Review of Safety Assessments for Moderate- and High-hazard Non-nuclear Facilities.*
 - CPR400.1.1.21/[GN470089](#), *Startup and Restart Process for Sandia Nuclear Facilities/Activities.*

Members of the Workforce should consult the appropriate [Division ES&H Team](#) or the [Safety Basis Department](#) for assistance with approving operations as ready to operate, resolving readiness findings, or questions regarding PHS module output from the [Integrated Safety Management System \(ISMS\) Software](#).



READINESS REVIEWS

Requirements

Managers shall be responsible for conducting readiness reviews for startup and restart of Sandia-controlled activities as specified in *ES&H Manual*, [Section 13D](#), "Readiness Review Process - Planning, Review and Approval," for all [operations](#) classified by the [Primary Hazard Screening \(PHS\)](#) as Standard Industrial Hazard (SIH) and higher hazard categories.

Note: The Readiness Review (RR) is a disciplined, systematic, and documented examination of personnel, procedures, processes, facilities, equipment, management control systems and Safety Management programs. Its purpose is to ensure the readiness of the facility/activity and personnel to start or restart facility/activity operations within the bounds of acceptable risk as described in the Safety Basis/Authorization Agreement (described in *ES&H Manual*, [Section 13C](#), "Authorization Basis Process") or the facility's or activity's authorization basis and in compliance with applicable ES&H requirements after the controls are implemented. This process is the verification or validation step that occurs after the completion of the authorization basis process (see *ES&H Manual*, [Section 13C](#), "Authorization Basis Process"), but prior to the start or restart of operations.

HAZARD AGGREGATION ROLLUP PROCESS (HARP)

The purpose of the HARP is to determine the hazard categorization for a facility and to evaluate the hazards of the facility, as a whole. This evaluation includes creating a list of hazards for the facility; identifying hazards and emergency actions that extend beyond the scope of individual PHSs; a rollup of radiological, chemical, biological, and explosives hazards in the facility; assuring facility infrastructure items (e.g., flammable gas tank) are included in the analysis; analyzing the hazards that could be posed by the interactions or aggregations of hazards; and identifying the controls necessary to address the hazards that are created when hazards identified in separate PHSs interact or are aggregated. The minimum size for a facility covered under a HARP is one building, except in cases where separation can be

demonstrated.

The HARP will identify hazards at the facility level, however, not all facilities will have a HARP. [Attachment 13A-4](#), "HARP Criteria," provides the criteria used to determine if a HARP is required for a facility. In addition, AOP 06-07, "A Guide to the Hazard Aggregation Rollup Process," has been prepared to assist individuals involved with the HARP in how to execute the various required actions and provides some methodologies and tools for Members of the Workforce to use.

Requirements

Management

Managers associated with the facility shall:

- Be familiar with the content and requirements in the HARP and ensure any relevant information is provided to Members of the Workforce working in the facility covered by the HARP.
- Provide funding and support, if necessary, for requirements identified in the HARP.
- Ensure that the HARP author is notified and that they obtain approval from the HARP author prior to moving any radiological material that exceeds 1% of the DOE Standard 1027-92 threshold quantity into or out of the facility in order to maintain a current "sum of ratios."
- Ensure that any changes to their activities are clearly described in the appropriate section of the PHS used to identify activity changes.

HARP managers (i.e., the owning managers, senior managers, directors, or vice-presidents identified in the HARP document by the author) shall approve the HARP final document.

Safety Basis Department

The Safety Basis Department shall:

- Develop and maintain the HARP and software.
- Develop and maintain the list of facilities or buildings that may require a HARP following the standards in [Attachment 13A-4](#), "HARP Criteria."
- Call and facilitate a meeting with the HARP subgroup members to finalize the list of

facilities requiring a HARP.

- Maintain the final HARP's List of facilities.
- Update the HARP's List on an annual basis using the criteria in [Attachment 13A-4](#), "HARP Criteria" and input from the HARP subgroup meetings.

HARP Subgroup Members

The HARP subgroup members shall:

- Consist of Division ES&H Coordinators and selected Safety Basis personnel.
- Review the preliminary list of facilities that may require a HARP and develop the final HARP's List of facilities, based on the HARP criteria.
- List all organizations within a facility.
- Identify a HARP author and approving manager for each facility requiring a HARP.
- Set a due date for completion of the HARP for each facility.
- Document the results of the determinations and evaluations including the rationale for adding or removing facilities from the preliminary list.
- Present the HARP's List to the Safety Basis Department Manager for approval.

HARP Author

HARP author shall:

- Have general knowledge of and understand operations and hazards within the facility to which he or she is assigned.
- Form a HARP team to produce a HARP document.

Note: The HARP team must have knowledge of all operations and hazards associated with the facility and the ability to adequately identify and evaluate those hazards.

- Have responsibility and accountability of the HARP documents they own.
- Identify the appropriate reviewers for the HARP.




● Lead the HARP planning and development effort following the process described in subsection "[HARP Summary](#)."

- Update the HARP on a biennial basis or whenever the bounds of the HARP are exceeded.
- Maintain the "sum of ratios" calculations for radioactive material.
- Update the "sum of ratios" calculations in the HARP before moving radiological material.

Note: This "sum of ratios" update does not require the HARP to go through the approval process.

- Serve as the facility point of contact when moving radiological material in excess of 1% DOE Standard 1027-92 threshold quantities.




● Contact the [Radiological Protection Department](#) before moving radiological material when the "sum of ratios" reaches 0.80.

- Ensure that records are maintained as defined in the subsection, "[Records](#)."

HARP Team Members

HARP team members shall:

- Attend the initial HARP training to understand the HARP process and their specific role in developing the HARP for their facility.
- Provide the HARP author with all information, within their area of expertise, necessary to complete the HARP.



● Assist the HARP author, as necessary, with entering information into the HARP module of the PHS software.

- Review the final HARP final document to ensure it represents a valid rollup of the hazards within their area of expertise.

ES&H Coordinators

ES&H coordinators associated with the facility shall:

- Provide the HARP author with the information about facility processes under their

jurisdiction necessary to complete the HARP.

- Review the HARP final document for technical accuracy.
- Sign the HARP final document upon concurrence with its content.



HARP Summary

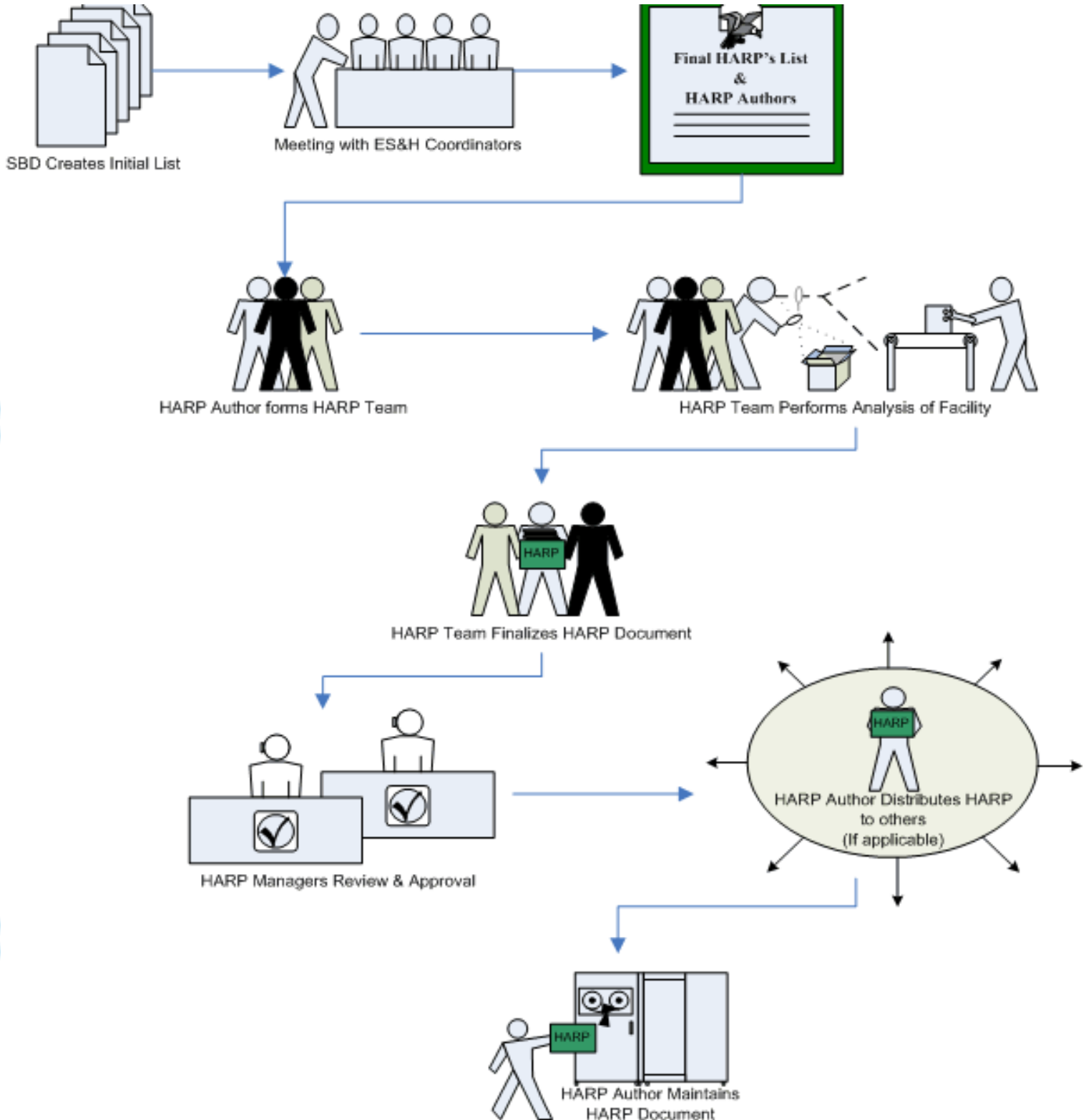


Figure 13A-1, HARP Major Steps

Figure 13A-1 depicts the major steps of the HARP. The information provided in this subsection outlines the HARP summary and provides a list of actions that are taken by Members of the Workforce to complete the major steps of the HARP.

The actions are listed in a general chronological order; however, many of the actions can be done in parallel or as a group. In addition, AOP 06-07, "A Guide to the Hazard Aggregation Rollup Process," has been prepared to assist those involved in the HARP with how to execute the various activities listed below and provides some methodologies and tools for Members of the Workforce to use.

Guidance

Managers should use the HARP in the design phase to identify facility hazards and determine a hazard classification for a new facility or major modifications to existing facilities.

HARP authors and team members should also be aware of the following issues:

- PHSs may cover more than one building, so hazards may not be present in the actual HARP building.
- Hazards in the HARP building may be in PHSs for other locations that may not have listed the HARP building in the locations table; this would cause hazards to appear missing.

Items like facility infrastructure may not be identified in the PHS for a building.

RECORDS

Requirements

Managers shall ensure that the records generated during the performance of hazard identification activities, hazard analyses, and reviews are maintained as described in accordance with the Sandia Records Retention and Disposition Schedule, [SA-140-205-000](#), "Preliminary Hazard Assessment (PHA)/ Preliminary Hazard Screen (PHS) Records."

Note: Records include completed checklists, HARP final reports from the previous year and a record of completion of the HARP, as applicable.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to the hazards identification and classification process include:

Hazard/Activity	Reference
Hazards Analysis (HA)	<i>ES&H Manual</i> , Section 13B , "Hazards Analysis Process"
National Environmental Policy Act (NEPA)	<i>ES&H Manual</i> , Section 10B , "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties"
Readiness Review	<i>ES&H Manual</i> , Section 13D , "Readiness Review Process - Planning, Review and Approval"
Hazard Assessment Documents (HAD)	PN471011 , SNL/NM Emergency Plan
Safety analyses for moderate- and high-hazard operations	<i>ES&H Manual</i> , Section 13C , "Authorization Basis Process"

REFERENCES

Requirements Source Documents

[10 CFR 830](#), Nuclear Safety Requirements.

DE-AC04-94AL85000, *Management and Operating Contract Between Sandia Corporation and DOE*:

[Section I, Clause 78](#): "DEAR 970.5223-1 Integration of Environment, Safety, and Health into Work Planning and Execution" (DEC 2000).

[Section I, Clause 73](#): "DEAR 970.5204-3 Access to and Ownership of Records" (DEC 2000).



[DOE O 151.1C](#), *Comprehensive Emergency Management System*.

[DOE O 420.1B](#), *Facility Safety*.

[DOE O 420.2B](#), *Safety of Accelerator Facilities*.

[DOE O 425.1C](#), *Startup and Restart of Nuclear Facilities*.

[DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*.

Implementing Documents



SNL, [AOP 06-02](#), *Primary Hazard Screening (PHS) Question Sets (Version G)*.

SNL, [PN471011](#), *SNL/NM Emergency Plan*.

Related Documents

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Cohrssen, J. and V. Covello, *Risk Analysis: A Guide to Principles and Methods for Analyzing Health and Environmental Risks*, National Technical Information Service, Springfield, VA, 1989.

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ES&H Manual

*SECTION 18G – IDENTIFYING, REPORTING, AND CORRECTING NUCLEAR AND WORKER SAFETY ISSUES AND NONCONFORMANCES

Subject Matter Expert: [Darlene Moore](#); CA Counterpart: N/A

MN471001, Issue D

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* Indicates a substantive change

- [Applicability](#)
 - [Training](#)
 - [Identifying, Reporting, and Correcting Nuclear and Worker Safety Issues and Nonconformances](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [18G-1](#) - Nuclear and Worker Safety Nonconformance Evaluation Guide
-

APPLICABILITY



Note: This document describes the mechanisms for identifying, reporting, and correcting nuclear and worker safety issues and nonconformances; and the implementation of the [Price-Anderson Amendments Act \(PAAA\)](#) requirements and reporting process.

For purposes of this document, Members of the Workforce (MOW) are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to activities performed by MOW for the Department of Energy (DOE)

- The nuclear safety requirements apply to activities on either [Sandia-controlled premises](#) or non-Sandia-controlled premises.
- The worker safety requirements apply to activities that support a DOE mission, on DOE sites which are [Sandia-controlled premises](#), and those non-Sandia-controlled premises owned, leased, or controlled by DOE.

Covered activities include those that have the potential to result in:

- A nonconformance with [DOE Nuclear Safety Requirements](#) as defined in CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual (RPPM)* or CPR001.3.2, *Corporate Quality Assurance Program*.
- Radiological harm, including activities at facilities where nuclear material is not present, but could potentially cause radiological damage at a later time; such as facilities that prepare the nonnuclear components of nuclear weapons.
- An occupational exposure to ionizing radiation or radioactive material.
- Occupational injuries and illnesses, or unsafe work conditions.
- Specific exclusions to this section are described in the following:
 - CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual (RPPM)*, "Introduction," [Section 2.0](#), "Applicability."
 - 10 CFR 830, [Subpart A](#), *Quality Assurance Requirements*, Exclusions.
 - 10 CFR 851.2, *Worker Safety and Health Program*, Exclusions.

Note: Questions regarding applicability of the [PAAA Nuclear Safety Rules](#) or the Worker Safety and Health Program should be forwarded to the Safety and Security Regulatory Support Office (SSRSO) [Program Manager](#) or the [ES&H Legal contact](#) (as

appropriate), and are addressed on a case-by-case basis.

TRAINING

Requirements

Managers shall be responsible for ensuring that MOW, who are involved in activities that may affect nuclear or worker safety, are provided with appropriate training to recognize hazards and ensure that work is performed in accordance with Sandia processes that implement the Nuclear [Safety Rules](#) and Worker Safety and Health Program (hereafter referred to as the Safety Rules).

Department managers, [facility managers](#), and [Division ES&H Coordinators](#) shall retain applicable training records according to departmental record retention requirements.

Guidance

Work Activity or Role	Required	Recommended
<p>Activities that may affect nuclear or worker safety such as the following:</p> <ul style="list-style-type: none"> • Design • Engineering • Maintenance • Lab operations • Construction • Service contract oversight and assessments 	N/A	<p>PAAA100, <i>Price Anderson Amendments Act. What It Means to You</i></p> <p>Price-Anderson Amendments Act As It Applies to Sandia National Laboratories</p> <p>PAAA200, Price Anderson Amendment Act</p> <p>CPR400.1.3, Price-Anderson Amendments Act (PAAA) and Nuclear and Worker Safety Requirements.</p>

Consult the SSRSO Project Manager for any additional training needs.

Note: Managers of the activities that have a potential to result in radiological harm should also complete [RAD250](#), *Management of Radiological Operations*.



IDENTIFYING, REPORTING, AND CORRECTING NUCLEAR AND WORKER SAFETY ISSUES AND NONCONFORMANCES

Requirements

Department managers, [facility managers](#), and [Division ES&H Coordinators](#) shall:

- Assess activities and conditions at their facilities for nuclear safety or worker safety issues and [nonconformances](#).
- Document the results of the assessment of the activities and conditions identified.
- Ensure that for all nuclear safety or worker safety nonconformances:
 - One of the following reporting processes is followed, as applicable:
 - CPR400.1.1/MN471001, *ES&H Manual*, [Section 18C](#), “Occurrence Reporting”
 - “Radiological Process Improvement Report (RPIR),” in CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual (RPPM)*, [Chapter 13](#), “Feedback and Improvement.”

Note: For an event that does not qualify as an occurrence but is an issue or [nonconformance](#) with the [DOE Nuclear Safety Requirements](#), or the Worker Safety and Health Program (Safety Rules), notify the Sandia Safety and Security Regulatory Support Office (SSRSO) Program Manager.

- A [causal analysis](#) is performed and that corrective actions, as applicable,



are sufficiently comprehensive to prevent recurrence. See [Section 22B](#), “Root Cause Analysis (RCA),” of this manual for additional information. Also follow CPR001.3.11, *Corporate Corrective Action Process*.

- Corrective actions are completed in a timely manner.
- Periodically recheck the corrective actions to ensure they are still in place and continue to be effective.
- Maintain an evidence file for completed corrective actions, (copies of causal analyses, corrective action plans, and corrective action closure evidence).
- Forward copies of evidence file documents to the SSRSO Program Manager if there is a Safety Rule noncompliance.



Members of the Workforce shall:

- Promptly report to their department manager, or as applicable, all nuclear safety or worker safety issues or nonconformances in accordance with:
 - CPR400.1.1/[MN471001](#), *ES&H Manual*
 - CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual (RPPM)*.
 - [CPR001.3.2](#), *Corporate Quality Assurance Program*.
- Business rules or processes used to protect against the potential of the following:
 - An exposure to ionizing radiation or radioactive material.
 - Radiological harm, including activities at facilities where nuclear material is not present but could potentially cause radiological damage at a later time, such as facilities that prepare the nonnuclear components of nuclear weapons.
 - Occupational injuries and illnesses or unsafe work conditions.
- Direct questions or concerns regarding Safety Rules nonconformance to their department manager or as described in [Chapter 18](#), “Reporting, Investigating, and Correcting ES&H Events.”





The Sandia Safety and Security Issues Review Committee shall:

- Review issues and nonconformances with corporate requirements to determine if they are also noncompliances with the Safety Rules, as described in [CPR400.1.3](#), *Price-Anderson Amendments Act (PAAA) Nuclear and Worker Safety Requirements*.
- Notify the appropriate members of line management of the issue disposition along with any additional required actions.

Guidance

Department managers, [facility managers](#), and [Division ES&H Coordinators](#) should:



- Be familiar with the guidance in Attachment 18G-1, “Nuclear and Worker Safety Nonconformance Evaluation Guide,” that describes the noncompliance reporting criteria by regulation.

The following reporting sources should be considered when performing periodic assessments for Safety Rules compliance:

- Occurrence Management reports.
- Self-assessment reports and Independent assessments.
- Radiological Protection Improvement Reports (RPIRs).
- Quality reports.
- Nonconformances reported by MOW.
- Management surveillances.
- Other sources, as applicable:
 - DOE evaluations (e.g., DOE facility representative reviews).
 - Audits by outside agencies (e.g., Defense Nuclear Facility Safety Board).



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to reporting Safety Rules nonconformances include:

Hazard/Activity	Reference
Activities at nuclear facilities or that have the potential to result in an occupational exposure to ionizing radiation or radioactive material	<p>CPR400.1.1.14/GN470080, <i>Implementing the Unreviewed Safety Question (USQ) Process for Nuclear Facilities.</i></p> <p>CPR400.1.1.38/GN470101, <i>Preparation and Review of Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) to Meet 10 CFR 830, Subpart B.</i></p> <p>CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual.</i></p>
Worker Safety and Health	CPR400.1.1 ES&H Manual, All Chapters
Causal analysis and corrective actions	<p>CPR400.1.1 ES&H Manual/ Chapter 22, “Feedback and Improvement Processes.”</p> <p>CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i>, Chapter 13, “Feedback and Improvement.”</p>
Reporting ES&H concerns	<p>CPR400.1.1 ES&H Manual/Chapter 18, “Reporting, Investigating, and Correcting ES&H Events.”</p> <p>CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i>, Chapter 13, “Feedback and Improvement.”</p>
Reporting Quality concerns	CPR001.3.2 , <i>Corporate Quality Assurance Program.</i>

REFERENCES

Requirements Source Documents

[10 CFR 708](#), *DOE Contractor Employee Protection Program*.

[10 CFR 820](#), *Procedural Rules for DOE Nuclear Activities*.

[10 CFR 830](#), *Nuclear Safety Management*.

[10 CFR 835](#), *Occupational Radiation Protection*.

[10 CFR 851](#), *Worker Safety and Health Program*.

Implementing Documents

[SNL, CPR001.3.2](#), *Corporate Quality Assurance Program*.

[SNL, CPSR400.1](#), *Environment, Safety, and Health Policy Statement Requirement*.

[SNL, CPR400.1.1](#)/MN471001, *ES&H Manual*.

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SNL, CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual (RPPM)*.

SNL, CPR400.1.1.38/[GN470101](#), *Preparation and Review of Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) to Meet 10 CFR 830, Subpart B*.

[SNL, CPR500.2.1](#), *Procurement Manual*.

[SNL, CPSR001.2](#), *Addressing Concerns of Unethical and Criminal Behavior*.

[PG470246](#), Sandia National Laboratories *10 CFR 851 Worker Safety and Health Protection Program (WSHPP)*.

[PG470208](#), Nuclear and Worker Safety Requirements Program Plan.

Related Documents

DOE Office of Enforcement, Enforcement Program Plan.

[DOE M 232.1-2](#), *Occurrence Reporting and Processing of Operations Information.*

[DOE O 231.1A](#), *Environment, Safety, and Health Reporting.*

[DOE--STD-1004-92](#), *Root Cause Analysis Guidance Document.*

[DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance With DOE Order 5480.23, Nuclear Safety Analysis Reports.*




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Sponsor: Dori Ellis, 4000, Acting

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ES&H Manual

CHAPTER 11 – ES&H TRAINING

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- [Applicability](#)
 - [Types of ES&H Training](#)
 - [*Responsibilities for ES&H Training](#)
 - [Additional Training Topics](#)
 - [References](#)
 - Attachments
 - [11-1](#) – ES&H Training for Visitors at SNL/CA
 - [11-2](#) – Line-Managed Training Standards
 - [11-3](#) – Line-Managed Training Development Level Decision Tool
-

APPLICABILITY

For purposes of this document, [Members of the Workforce](#) are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This chapter addresses three types of ES&H Training: corporate-managed, program-managed, and organization-managed.

This chapter does **not** address the performance-based training processes required at nuclear facilities and for safeguards and security. Those organizations may have to meet certain DOE requirements for performance-based training and qualification programs as stated in [DOE 5480.20A](#) and [DOE O 470.1](#), respectively.

Note: Specific requirements for ES&H training are identified in other chapters of this manual and its supplements.

TYPES OF ES&H TRAINING

This chapter addresses three types of ES&H Training: corporate-managed, program-managed, and organization-managed.

Corporate-Managed Training

This type of training is usually generic enough to be applicable to a wide audience – typically across center lines. The program owner (or their designee) interprets regulations and requirements into training requirements and requests that training be developed. Corporate Learning and Professional Development (CL&PD) is responsible for all training development, implementation, maintenance, and record retention (see [CL&PD Training Standards and Procedures](#)). The Primary Hazard Screening (PHS) process identifies corporate-managed ES&H training requirements. Links to these courses appear in the *ES&H Manual*.



Program-Managed Training

This type of training is usually specific to a limited number of facilities or job functions and is typically designed to be taken after initial corporate-managed training is completed. The program owner is responsible for training development, implementation, and maintenance. The line is responsible for student record retention. The Primary Hazard Screening (PHS) process identifies program-managed ES&H training requirements. Links to these courses appear in the *ES&H Manual*. [Line-Managed Training Standards](#) apply.

Organization-Managed Training

This type of training is specific to just one organization or facility. The initiating organization is responsible for all training development, implementation, maintenance, and record retention. [Line-Managed Training Standards](#) apply.

Note: Line-managed ES&H training incorporates program-managed and organization-managed training. [Line-managed training](#) is usually specific to a limited number of sites, organizations, facilities, projects, or job functions. The degree of rigor imposed on training depends on the levels of risk and consequences.

*RESPONSIBILITIES FOR ES&H TRAINING

To determine who is responsible for managing which type of ES&H training, see [Ownership by Activity](#) in Corporate Learning and Professional Development (CL&PD) Training Standards and Procedures website.

Note: Clarifying responsibilities prior to starting any training development effort is critical to ensure project success. “Ownership by Activity” summarizes who does what for the three categories of training. Also, included in this table is a suggested activity sequence that corresponds to the Instructional System Design processes.

CL&PD Technical and Compliance Training Manager

Requirements

The CL&PD Technical and Compliance Training Manager shall be responsible for:

- Developing, implementing, and maintaining all corporate-managed ES&H training as well as retaining all associated program and student records.
- Providing the organizations with a [Line-Managed Training Development Level Decision Tool](#) to determine the level of rigor at which [line-managed training](#) is developed.
- Providing organizations with guidance in interpreting the [Line-Managed Training Standards](#) (when requested).
- Assisting the line in clarifying the systematic approach to ES&H training and related requirements (when requested).
- Assisting the line in all phases of the ES&H training development process on a charge-back basis (when requested).
- Ensuring that all corporate-managed ES&H training completions are entered into the Training and Employee Development System (TEDS).
- Ensuring corporate-managed ES&H training records are maintained in accordance with the [Sandia Records Retention and Disposition Schedule](#), Record Series Number HR-104-201 through HR-104-207-000, which are included in the Records Management Manual.
- Providing opportunities for qualifying classroom and [On-The-Job Training \(OJT\) instructors](#) for ES&H courses.

*ES&H Functional Managers/Program Owners

Requirements

ES&H functional managers/program owners shall be responsible for:

- **Identifying** ES&H training requirements.
- Determining if applicable training requirements are covered in existing ES&H courses, or if a new course is needed.

- If a new course is needed, consulting the ES&H course development contact to determine who is responsible for managing the training (CL&PD, the program owner, or the organization) and which ES&H training compliance standards apply.
- Selecting [instructors](#) for corporate and program-managed ES& H training and ensuring that instructors for these courses are [qualified](#) according to standards found in the [Qualifying Instructor Procedures](#) located on the Corporate Learning and Professional Development (CL&PD) Training Standards and Procedures website.
- Developing, implementing, and maintaining program-managed ES&H training.
- Ensuring program records for program-managed ES&H training are maintained in accordance with the Sandia Records Retention and Disposition Schedule, Record Series Number HR-104-201 through HR-104-207-000, which are included in the Records Management Manual (RMM).




Managers

Requirements


Managers shall be responsible for:

- Completing ES&H Awareness ([ESH100](#)).
- Completing Safety Management ([ESH200](#)) and any other ES&H training required by their job function, work assignment, or location.
- Assisting employees new to the organization or job with completing SNL ES&H Safeguards & Security Orientation for New and Transferred Employees ([NEO200](#)).
- Determining ES&H training requirements for all personnel assigned to their organization (including those who are matrixed to another manager to perform work) and all individuals performing work under their direction (e.g., visitors and consultants) and ensuring that these requirements are entered into those individuals' "To Do" lists in the Training and Employee Development System (TEDS).



- 
- Ensuring all personnel assigned to their organization and all individuals performing work under their direction complete required training prior to performing related work.

Note: Untrained Members of the Workforce may temporarily work under the direct supervision of an appropriately [qualified](#) Member of the Workforce if they are given documented manager-approved instructions (including specific activities, conditions, and duration) prior to performing the work.

- 
- Approving and documenting instructions (including the specific activities, conditions, and duration) given to untrained Members of the Workforce who are working under the direct supervision of an appropriately [qualified](#) Member of the Workforce.
 - Ensuring that training equivalency requests for their personnel have met the ES&H program or legal requirements of the existing Sandia compliance course.
 - Documenting the basis for exempting a person in their organization or under their direction from completing established ES&H training requirements.
 - Ensuring that the ES&H training completions for their personnel are entered into TEDS for all courses that are not corporate-managed (not in the ES&H manual nor its supplements).
 - Ensuring student records for ES&H training that is not corporate-managed are maintained in accordance with the Sandia Records Retention and Disposition Schedule, Record Series Number HR-104-201 through HR-104-207-000, which are included in the Records Management Manual.
 - Using the [Line-Managed Training Standards](#) and the [Line-Managed Training Development Level Decision Tool](#) to:
 - Implement line-managed classroom courses and [On-the-Job Training \(OJT\)](#) where safety or program-critical procedures are performed on the job.
 - Ensure a systematic approach to their [line-managed training](#) is adhered to using a [graded approach](#).
 - Addressing the level of risk and consequences when determining the level of rigor

their [line-managed training](#) requires and ensuring that the requirements for that rigor category are followed.

- Determining the level of formality at which the required training documents for their [line-managed training](#) are developed.
- Ensuring that the minimum documentation requirements for all [line-managed training](#) are met.
- Ensuring maintenance of all [line-managed training](#) documents and related materials is consistent with SNL, DOE and any other organization specific requirements.
- Ensuring that [instructors](#) for organization-managed ES&H training are [qualified](#).

Guidance

When establishing required courses for Members of the Workforce and others (e.g., visitors), managers should:

- See [CPR300.7.3, Chapter 2, In-House Training Programs, Section 3.3.1, All-Employee Required Training](#) to learn what is required for employees. See [Determining Contractor Training Requirements](#) on the Corporate Learning and Professional Development (CL&PD) Training Standards and Procedures website to learn what is required for contractors.
- Be aware of the process for receiving equivalency credit for courses as described in the [Training Equivalencies](#) section of the Corporate Learning, and Professional Development (CL&PD) Training Standards and Procedures website. Managers may consult the ES&H course development contact for guidelines regarding interim solutions.

Members of the Workforce

Requirements

Members of the Workforce shall be responsible for:

- Complying with the specific ES&H training requirements that are identified in other chapters of this manual and its supplements.
- Completing ES&H Awareness ([ESH100](#)) annually.
- Completing SNL ES&H Safeguards & Security Orientation for New and Transferred Employees ([NEO200](#)), if they are new to an organization or job.
- Completing any other ES&H courses required by their job function, work assignment, or location.

Note: Facilities, construction, and service contractors' ES&H training requirements are addressed in the specifications of their contracts.

Note: SNL hosts shall ensure that visitors who observe activities, but do not perform work, receive any site- or facility- hazard briefing that is available. SNL hosts and their managers (if host is not a manager) shall also determine appropriate ES&H training for visitors performing work. SNL/CA-specific ES&H training requirements related to visitor training are presented in Attachment 11-1, [ES&H Training for Visitors at SNL/CA](#).

Sandia Delegated Representatives (SDRs) or Requestors

Guidance

Sandia delegated representatives or requestors should:

- Determine what ES&H training and refresher courses contractors need.
- Ensure that generic training requirements are identified in statements of work (SOWs) or the tactical staffing requisitions (TSRs).
- Ensure that Sandia-specific ES&H training requirements are met.


ADDITIONAL TRAINING TOPICS

Guidance

Members of the Workforce may find additional information on the following topics on the [CL&PD Training Standards and Procedures](#) website:

- 
- [Training Equivalencies](#)
 - [Enrollment Process](#)
 - [Instructor Qualification](#)
 - [Determining Training Requirements](#)
 - [Determining Contractor Training Requirements](#)
 - [Training Completion Record Retention](#)

Members of the Workforce may use [TEDS Everyone](#) to:

- 
- Search for a course
 - Get details about a course
 - Enroll in a course
 - View their current training assignments, enrollments, and completions

For additional training related information, consult the [CL&PD Homepage](#).

REFERENCES



Requirements Source Documents

[DOE N 142.1](#), *Unclassified Foreign Visits and Assignments*.

[DOE O 414.1B](#), *Quality Assurance*.

SNL, [CPR001.3.3](#), *Formality of Operations Manual*.

Implementing Documents

[DOE 5480.20A](#), *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.

SNL, CPR001.3.3, *Formality of Operations Manual*, [Chapter 5](#), “Control of On-The-Job Training.”

SNL, [CPSR001.3](#), *Integrated Laboratory Management System*.

SNL, [CPSR300.7](#), *Education Training & Development*.

SNL, [CPR300.7.3](#), *In-House Training Programs*.

SNL, [CL&PD Training Standards and Procedures](#).

SNL, [TEDS Everyone](#).

SNL, [Contractor Training Instructional Aid](#).

Related Documents

[DOE O 470.1](#), *Safeguards and Security Program*.

[DOE Technical Standard, DOE-STD-1206-98](#), *Guide to Good Practices for On-The-Job Training*.

SNL, [CPR 400.2.20](#), *Management of Information Throughout its Life Cycle*.

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ES&H Manual

SECTION 10D - POLYCHLORINATED BIPHENYL (PCB) MANAGEMENT

Subject Matter Expert: [David Castillo](#); CA Counterpart: [Janet Harris](#)

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* Indicates a substantive change



- [Applicability](#)
- [Training](#)
- [*Identification](#)
- [Equipment Labeling](#)
- [Use and Handling](#)
- [Storage for Reuse](#)
- [30-Day Temporary Storage for Disposal](#)
- [Disposal](#)
- [Spills and Leaks](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - 10D-1 - Sample Polychlorinated Biphenyl (PCB) Label ([Word file](#)/[Acrobat file](#))
 - 10D-2 - Sample SNL Polychlorinated Biphenyl (PCB) Survey Label and Tag ([Word file](#)/[Acrobat file](#))



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all SNL/NM and TTR activities involving the processing, use, accumulation, or requesting disposal of polychlorinated biphenyls (PCBs) or [PCB items](#).

At SNL/CA, [PCB](#)-related activities are performed in accordance with the requirements in [GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.

At KTF, Members of the Workforce follow U.S. Navy requirements and applicable Hawaii state laws.

At locations other than SNL/NM, SNL/CA, TTR, and KTF, the following requirements apply (in order of importance):

1. State and local regulations applicable to the site.
2. Requirements of the host facility.
3. Requirements of this document when not in conflict with either of the above.

TRAINING

Work Activity or Role	SNL/NM and remote	
	Required	Recommended
Members of the Workforce who process, use, accumulate, or request disposal of polychlorinated biphenyls (PCBs)	N/A	ENV190

*IDENTIFICATION

*Requirements

Owners of oil or substances, or items and equipment, known or suspected to have been manufactured prior to 1980, that contain oil shall determine if the oil contains polychlorinated biphenyls (PCBs) and at what concentration. This may be accomplished either by contacting the [PCB program coordinator](#) to request sampling/analysis or by reviewing the [material safety data sheet](#) (MS DS) or other documentation for the equipment. Substances that may contain PCBs include, but are not limited to: dielectric fluids, solvents, heat transfer fluids, hydraulic fluids, paints or coatings, sludges, slurries, sediments, dredge spoils, soils, and other chemical substances or combinations of substances, including impurities and byproducts and any byproduct, intermediate, or impurity manufactured at any point in a process.

Members of the Workforce shall:

- Assume capacitors manufactured before July 2, 1979, whose PCB concentration cannot be established, contain ≥ 500 parts per million (ppm) PCBs. Capacitors manufactured after July 2, 1979, or marked at the time of manufacture with the marking "No PCBs" may be assumed non-PCB (i.e., <50 ppm PCB). Capacitors with an unknown date of manufacture shall be assumed to contain ≥ 500 ppm PCBs.
- Assume mineral oil-filled electrical equipment, other than capacitors, manufactured before July 2, 1979, whose PCB concentration cannot be established, contain ≥ 50 ppm and <500 ppm PCBs. Mineral oil-filled electrical equipment manufactured after July 2, 1979, may be assumed non-PCB. Mineral oil-filled electrical equipment with an unknown date of manufacture shall be assumed to contain ≥ 50 ppm and <500 ppm PCBs.
- Assume that all materials that come into contact with PCBs having a concentration ≥ 50 ppm are PCB contaminated and shall be managed according to the requirements of this section.
- Inform the [PCB program coordinator](#) of all equipment identified to contain PCBs at ≥ 2 ppm.

Guidance

PCBs are most likely found in oil-filled electrical equipment (e.g., transformers, capacitors, fluorescent light ballasts), hydraulic systems, and heat transfer equipment manufactured before July 2, 1979. Most oil-containing equipment at SNL/NM has been sampled to determine [PCB](#) concentration, if any. Such equipment should already be marked with that information.

EQUIPMENT LABELING

Requirements

Members of the Workforce shall label all containers and equipment that is identified as containing 50 parts per million (ppm) polychlorinated biphenyls (PCBs) or greater with the [PCB](#) marking M_L (see Attachment 10D-1 [[Word file/Acrobat file](#)]).

Note: This requirement applies to material and waste.

Guidance

Managers or owners should ensure that equipment that has been determined to contain less than 50 ppm PCBs is marked with a PCB Survey Label (see Attachment 10D-2 [[Word file/Acrobat file](#)]) to prevent redundant identification. The PCB Survey Label will be provided and completed by the [PCB program coordinator](#) upon request.

USE AND HANDLING

Requirements

Members of the Workforce shall only use polychlorinated biphenyls (PCBs) or [PCB items](#), regardless of concentration, in a [totally enclosed manner](#).

Members of the Workforce who own PCBs or [PCB items](#) shall handle them in a manner that prevents the spread of [PCB](#) contamination to equipment, structures, or other material due to the difficulty and cost of clean up and decontamination.

Guidance

Members of the Workforce may use PCBs in other than a [totally enclosed manner](#), provided that the PCB program coordinator is notified to determine if the manner is allowed by the regulations and to provide specific regulatory requirements if it is:

- PCBs at concentrations less than 50 ppm used in heat transfer and hydraulic systems.
- PCBs used in specific authorized research development activities.
- PCBs used in specific scientific instruments.
- PCBs used as analytical reference samples.

STORAGE FOR REUSE

Requirements

Owners of PCB articles that are in storage for reuse shall:

- **Not** store the articles for more than 5 years from the date the article was originally removed from use.
- Maintain records, beginning when the article is removed from use, that indicate:
 - The date the article is removed from use or August 28, 1998, if the date is unknown.
 - The projected location and future use of the PCB article.
 - If applicable, the date the PCB article is scheduled for repair or service.

Owners who intend to continue storing PCB articles past 5 years after the date they were originally removed from use shall contact the PCB program coordinator at least 6 months before the end of the 5-year period for additional requirements.



30-DAY TEMPORARY STORAGE FOR DISPOSAL

Containers

Requirements

Members of the Workforce shall place:

- Waste polychlorinated biphenyls (PCBs) and [PCB items](#) in a container that is capable of preventing the spread of contamination unless the PCBs are completely contained by the item, such as totally enclosed electrical equipment.
- Waste contaminated items, such as personal protective equipment (PPE), rags, etc., in a plastic bag, with a minimum 6-mil thickness sealed to prevent spread of contamination."



30-Day Temporary Storage

Requirements


Members of the Workforce shall:

- Store PCB waste at a 30-day temporary storage area limited to the following types of PCB waste:
 - Non-leaking [PCB articles](#) and [PCB equipment](#)
 - Leaking [PCB articles](#) and [PCB equipment](#) **only if** the items are placed in a non-leaking [PCB container](#) that contains sufficient sorbent material to absorb any liquid PCBs remaining in the items
 - Containers of non-liquid PCB waste, such as contaminated soils, rags, and debris
 - Containers of liquid PCB waste with a concentration between 50 and 500



ppm at the direction of the [PCB program coordinator](#)

- Comply with the following requirements for 30-day temporary storage of [PCB](#) waste:

- 
- The storage area shall be marked with the PCB M_L marking (see Attachment 10D-1 [[Word file/Acrobat file](#)]).
 - Each waste [PCB item](#) or container shall be marked with the date the waste was removed from service for disposal. The date shall be clearly marked in plain view and be preceded by the words "Removed from service date."
 - PCB waste containers shall be handled and managed such that no PCBs shall leak out or contaminate any external surface of the container.
 - Both liquid and non-liquid PCB waste shall be stored in containers that meet DOT Packing Group III requirements.
 - The PCB waste shall **not** be stored in excess of 30 days from the date it was removed from service for disposal.

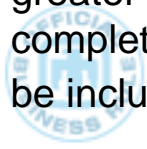


Guidance

Members of the Workforce should request disposal of PCBs and [PCB items](#) within 20 [calendar days](#) of the removed from service date to avoid exceeding the 30-day time limit.

DISPOSAL

Requirements



Owners of waste polychlorinated biphenyls (PCBs) or [PCB items](#) with a concentration greater than two parts per million (ppm) shall request disposal by submitting a completed. [Waste Description Disposal Request](#). Only waste PCBs and [PCB items](#) shall be included on a single WDDR.

SPILLS AND LEAKS

Requirements

Owners of polychlorinated biphenyls (PCBs) or [PCB items](#) that have spilled or leaked shall immediately contact the [PCB program coordinator](#) or the SNL Emergency (911) or Non-Emergency (311 or 845-6515) Hotlines, as appropriate, to report the spill or leak.

Members of the Workforce shall assume that all surfaces that come into contact with PCBs with a concentration of 50 parts per million (ppm) or greater are PCB contaminated and shall dispose of such items in accordance with the topic, "[Disposal](#)." Examples of PCB-contaminated items include, but are not limited to: personal protective equipment (PPE), cleanup material, and hand tools.

RELATED HAZARDS AND ACTIVITIES

Other hazards related to polychlorinated biphenyls ([PCBs](#)) include the following:

Hazard / Activity	Reference
Disposal request preparation	Request disposal of waste using a WDDR by linking to the Disposal Process website.
Reapplication of PCB-contaminated equipment	CPR 500.2.3, Property/Assets User's Manual, " Identifying and Removing Excess Property. "
Oil spills	Section 10F , " Oil and Fuel Storage "
Communication of industrial hygiene-related information	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"

REFERENCES

Requirements Source Documents

[40 CFR 761](#), *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions*.

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ES&H Manual

*SECTION 4E – HOT WORK SAFETY


Subject Matter Expert: [Paul E. Giering](#); CA Counterpart: [Marty Gresho](#)

MN471001, Issue L

Revision Date: [March 19, 2007](#); Replaces Document Dated: September 22, 2006

Review Date: September 13, 2006

*Indicates a substantive change

- 
- [Applicability](#)
 - [*Training](#)
 - [Hot Work Activities Summary](#)
 - [Other Qualifications](#)
 - [*Hot Work Permits](#)
 - [Personal Protective Equipment \(PPE\)](#)
 - [Oxygen-Fuel Gas Welding and Cutting](#)
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 - [Locations Presenting Elevated Fire Risk](#)
 - [Combustible Metals \(or Alloys\)](#)
 - [Fire Watching](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [4E-1](#) - Sample Hot Work Permit (SNL/NM)
 - [4E-2](#) - Sample Permit: Cutting, Welding, and Open Flame (SNL/CA)
 - [4E-3](#) - Guide for Shade Numbers (From ANSI Z49.1-1994)
 - Forms
 - SF 2001-HWA, Hot Work Operator Authorization Form ([Word file](#)/[Acrobat file](#))
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose activities include any of the following at [Sandia-controlled premises](#) involving [hot work](#), such as operating welding equipment or cutting torches, including:

- Working in designated welding shops.
- Using portable welding machines, including those on vehicles.
- Using welding or cutting torches in research and development (R&D) laboratories.
- Using oxygen-fuel gas torches and arc welders.
- Using open flame torches for operations, such as brazing and soldering.
- Using open-flame torches and hot-air blowers in roofing operations.

The following processes or activities are **not** considered hot work activities:


- Laser welding, electron beam welding, and orbital welding activities, because these activities do **not** use open flame operations, but rather are self-contained systems.
- Laboratory activities that use small, non-portable flames, if permitted by the [site fire marshal](#) or the [fire protection](#) contact. The site fire marshal or the fire protection contact shall determine whether a hot work permit, pertinent training, and other hot work requirements stated in this document are required for these types of operations.
- **If** the operation of the small, non-portable flame is specifically addressed in the

lab's documentation (PHS, SWP, OP, SOP) then no permit is needed, but if **not** (1 time operation) then a permit should be obtained.

*TRAINING

*Requirements

Managers shall be responsible for ensuring that Members of the Workforce who perform [hot work](#) activities, such as welding and cutting, are suitably trained in the safe operation of equipment and the safe implementation of relevant processes as follows:



Role or Work Activity	Required	Recommended
Hot Work (operations including cutting, welding, electric arc welding, Thermit welding, brazing, soldering, grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar situation.)	FRP106	N/A
Fire watch(er).	FRP106	N/A
Tar & Kettle Roofing Operations	FRP106	N/A
Propane-fired barbecue grills.	FRP106	N/A
Use of cylinders containing compressed gases in welding activities associated with laboratory operations.	FRP106	PRS150

Note: Training records for courses are maintained in the TEDS database.

Sandia employees and Sandia-Directed Contractors who perform hot work or are designated as fire watchers are required to have taken FRP106 (Fire Extinguisher Training Hands-On) prior to performing hot work or firewatch duties, and **annually** thereafter. If FRP106 (Fire Extinguisher Training Hands-On) is **not** available at the time

the Sandia employee or Sandia-Directed Contractor wants to perform hot work or firewatch duties, then offsite vendor training is acceptable for the interim. (SNL/NM only – no offsite vendor training is available at SNL/CA. At SNL/CA, FRP 106 is offered monthly).

HOT WORK ACTIVITIES SUMMARY

Requirements

[Hot work](#) operators and [fire watchers](#) shall adhere to the requirements associated with the following summary of hot work activities:

Work Activity	Training	Hot Work Permit	Personal Protective Equipment (PPE)	Fire Extinguisher
Welding, cutting, brazing	X	X	X	X
Open-flame soldering	X	X	N/A	X
Fire watch	X	X	N/A	X
On pressure or vacuum vessel	X	X	N/A	N/A
Arc welding	X	X	X	X
Oxygen-gas fuel welding and cutting	X	X	X	X
Propane-fired barbecue grill use	X	X	N/A	X
Hot-air or open-flame roof repair	X	X	X	X
All spark-producing cutting or grinding is considered hot work.	X	X	X	X

Note: The PPE column is intended to alert workers to those activities likely to require special PPE. Refer to [Chapter 6](#) or consult with the [Division ES&H Customer Support Team](#) for additional guidance.

OTHER QUALIFICATIONS

Requirements

Before conducting [hot work](#) operations, all hot work operators and [fire watchers](#) shall:

- View, at least once a year, a welding and cutting fire safety film provided by the [fire protection](#) contact. At SNL/NM, the fire protection contact maintains records of this training. At SNL/CA, taking FRP 106 satisfies this requirement.
- View a fire extinguisher training film at least once a year. The [fire protection](#) contact maintains records of this training. At SNL/CA, taking FRP 106 satisfies this requirement.
- Read the precautions printed on the Hot Work Permit (Attachment [4E-1](#), "Sample Hot Work Permit (SNL/NM)", or Attachment [4E-2](#), "Sample Permit: Cutting, Welding, and Open Flame (SNL/CA)" before conducting hot work operations.

Managers shall authorize Members of the Workforce to perform hot work activities only after ensuring that they are qualified to perform this type of work through one of the following:


- Union qualifications upon hire.
- Apprenticeship program.
- Documentation (e.g., training, certification).

Guidance

Managers may use SF 2001-HWA, *Hot Work Operator Authorization Form* ([Word file/ Acrobat file](#)) to authorize an operator's hot work activities.

Members of the Workforce who perform hot work operations should be:


- Familiar with material and/or equipment and other related hazards.

- 
- Familiar with the applicable alarm system.
 - Able to activate an alarm in the event of a fire.
-

*HOT WORK PERMITS


Requirements

Managers shall be responsible for:


- 
- Designating precautions to be followed, in the form of a [hot work permit](#) obtained from fire protection, when granting authorization for [hot work](#) operations to proceed; and conspicuously posting the permit at hot work sites for the following operations unless specifically waived by the [site fire marshal](#):
 - **All** hot work. (Permits for hot work in areas where explosives are present shall be reviewed by the appropriate [Division ES&H Team](#)).
 - Maintaining permits for the duration of activities. Hot work activities shall **not** exceed the periods for which the Hot Work Permits are issued.
 - Ensuring that areas are inspected for adherence to the requirements listed on the hot work permit.
 - Ensuring that necessary mechanical ventilation is provided.
 - Ensuring that the Industrial Hygienist on the [Division ES&H Customer Support Team](#) is contacted to complete an occupational exposure assessment (OEA) prior to obtaining a hot work permit or initiating hot work activities involving brazing, thermal cutting, or welding. Contractor Personnel [Contractor-Directed] are also responsible for completing a representative occupational exposure assessment (OEA) for their employees. An OEA is required prior to the commencement of the initial hot work activity and when changes in materials, work controls, or any operational conditions may impact personnel exposure. If a documented OEA has been previously completed and is representative of the proposed hot work activity, an additional OEA is **not** necessary.

Operators shall work on objects to be welded or cut in a designated welding area or an area that satisfies the requirements of the hot work permit.

Managers shall be responsible for obtaining authorization, approval, or waiver for any of the situations below (noted in the Special Conditions section of the hot work permit):

- 
- For authorization for any hot work operations in an area where explosives are used or stored, consult the [explosives](#) contact.
 - For approval for any hot work operations that must be performed within 35 feet of flammable liquids and motor vehicles, other than the equipment being used on the job, consult the [site fire marshal](#).
 - For written approval before performing open-flame soldering, welding, or cutting operations on used containers, consult the [site fire marshal](#).
 - For a waiver if a hot work permit is **not** required to be obtained and posted at the hot work site, consult the [site fire marshal](#).


Guidance



For information about obtaining a hot work permit, Members of the Workforce should consult the [hot work permit](#) contact. (See Attachment [4E-1](#), "Sample Hot Work Permit (SNL/NM)," for a sample SNL/NM Hot Work Permit or Attachment [4E-2](#), "Sample Permit: Cutting, Welding, and Open Flame (SNL/CA)" for a sample Permit: Cutting, Welding, and Open Flame (permit for SNL/CA).

PERSONAL PROTECTIVE EQUIPMENT (PPE)

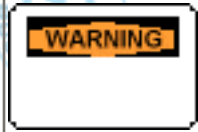
Requirements



Members of the Workforce performing [hot work](#) activities shall be protected from the hazards of these activities by wearing the appropriate protective clothing and equipment as indicated in the following table:

Hazard	Role	Personal Protective Equipment (PPE)
Damage to the lungs	Welders/welding operators , fire watchers , welders' helpers, and anyone in the immediate vicinity observing a welding operation.	Contact the appropriate Division ES&H Team for assistance in determining the need for respiratory protection.
Burns, heat radiation, or contact with flying bits of metal	Welders/welding operators.	Impact- and heat-resistant goggles or eye protection, and in many case, helmets and eye protection that resist heat, fire, impact, and electricity.
Damage to the eyes from intense light	Welders' helpers, fire watchers, and anyone in the immediate vicinity observing a welding operation.	Protective eye wear as required in Attachment 4E-3 , "Guide for Shade Numbers" (All lenses and filters shall be clearly marked for easy identification. Inspect protective eye wear prior to use for damage and degradation).
Bodily injury from thermal and ultraviolet (UV) radiation	Welders/welding operators.	Protective clothing that provides both thermal and UV protection. Caps, sleeves, or shoulder covers with bibs made of leather or other flame-resistant material during overhead hot work operations.
Injuries to the hands	Welders/welding operators, workers performing hot-air or open-flame roof repair, cutting, or grinding in a location having the potential for forming flammable or explosive mixtures.	Protective, flame-resistant gloves (Gloves made of leather or other suitable material are recommended). For heavy work, flame-resistant leggings or their equivalent will give added protection to the legs.

Damage to the ears
(hearing)



Welders/welding operators, fire watchers, welders' helpers, and anyone in the immediate vicinity observing a welding operation.

Contact the appropriate [Division ES&H Team](#) for assistance in evaluating noise hazards, and if required, recommending noise controls or hearing protection devices.

Guidance



Warning: Members of the Workforce performing hot work should evaluate whether a potentially hazardous situation is created when additional [personal protective equipment \(PPE\)](#) is worn with standard welding protection. Members of the Workforce should contact their [Division ES&H Team](#) for assistance.

OXYGEN-FUEL GAS WELDING AND CUTTING

Requirements

Managers shall be responsible for ensuring that:

- All manifold systems and gas handling equipment meet the requirements of [29 CFR 1910.253](#) as described in [MN471000](#), *Pressure Safety Manual*.
- Hoses are properly rated for the designated service, are properly connected, and do not use clamps or wire for connections.
- All oxygen-acetylene or other fuel gas torch systems have a:
 - Pair of check valves (which automatically limit the flow in a piping system to a single direction) mounted between the hoses and the mixing barrel on the torch.
 - Flashback protection device between the hoses and the regulator on the bottle side to prevent a flashback from passing the point where the

protection device is installed in a torch.

Note: It is recommended that flashback protection devices and check valves be installed in both the oxygen and acetylene lines.

Operators shall:

- Use manufacturer's recommended procedures for shutting off the torches.
- Inspect [hot work](#) equipment before use and replace defective equipment before proceeding.
- Place gas cylinders and machinery outside confined spaces.
- Store acetylene cylinders valve-end up.
- Not open an acetylene cylinder valve more than 1½ turns of the handle, and preferably, no more than ¾ turn.

Guidance

Operators should have the manufacturer's manuals for equipment in use.

HOT WORK OPERATIONS

Requirements

Operators shall:

- **Not** perform [hot work](#) within 35 feet of flammable/combustible material. If the material cannot be moved, it shall be protected by a noncombustible shield, curtain, or appropriate fire-resistant material.
- Prevent the passage of sparks or slag to adjacent areas containing combustible materials through openings or cracks in walls, floors, ducts or shafts within the hot work area by one or more of the following:



- Tightly covering openings and cracks with non-flammable/non-combustible material.
- Shielding them by metal fire-resistant guards.
- Providing curtains that prevent the passage of sparks or slag.
- Consult the [facilities support](#) contact at least 24 hours in advance to arrange for smoke detection devices to be blocked out for the duration of hot work operations. At SNL/CA, consult the [fire protection](#) contact.
- Protect or shutdown ducts and conveyors.
- Provide warning of hotspots to subsequent shifts.
- Ensure that all gas cylinders are labeled (e.g., supplier labeling or Chemical Information System (CIS) label).
- Remove all electrodes from the holders, locate the holders carefully so that accidental contact cannot occur, and disconnect the machine from the power source when electric arc hot work or cutting is to be suspended for any substantial period of time, such as during lunch or overnight.



Managers shall be responsible for ensuring that:

- Fully charged and operable fire extinguishers, appropriate for the type of possible fire, are available at the work area.
- Fluxes, coatings, coverings, and filler metals that are transferred to a secondary container are labeled in accordance with [Section 6D](#), "Hazard Communication Standard." (A number of potentially hazardous materials are incorporated into fluxes, coatings, coverings, and filler metals. Manufacturers' of this material have strict labeling requirements).



Guidance

Operators should:

- Position material being cut so that the severed section does **not** fall on any part of

their bodies.

- Protect visitors and passersby from exposure to arcs or other hazards.
- If possible, relocate work to a safe location.



LOCATIONS PRESENTING ELEVATED FIRE RISK

Requirements

Managers shall consult the [fire protection](#) contact for assistance during the planning stage of activities that require [hot work](#) to be conducted in one of the following high fire-risk locations:

- Fuel gas generator tanks and piping in rooms where fuel gas is generated.
- Exhaust ducts attached to wood, rubber, or fiber working machines and other ducts that may be coated on the inside with a flammable residue.
- Ducting in which flammable, toxic, or explosive vapors have been, or may be, present.
- Area where combustible fibers are used, stored, or in woodworking areas.
- Impregnating tanks where flammable liquids are involved.
- Any area where wet-cell batteries are present.
- Outdoors where dry brush and vegetation is present.



COMBUSTIBLE METALS (OR ALLOYS)

Requirements



Operators shall:

- Weld combustible metals (and alloys of combustible metals) only in areas specifically established for that purpose and equipped with inert arc welding equipment and special magnesium fire-fighting equipment.
- Place combustible metal dust, filings, and chips in closed, noncombustible containers, or remove them from the welding area before any welding begins.



FIRE WATCHING

Requirements

Operators performing [hot work](#) operations at other than permanent hot work locations shall station at least one person (the [fire watcher](#)) to watch for and extinguish any blazes. (At SNL/CA, posting of fire watch[ers] is determined by the [site fire marshal](#).)

Operators performing [hot work](#) operations shall ensure that:

- Fire watchers are provided during hot work activities and shall continue for 30 minutes after the conclusion of the work and during the operator's breaks (lunch, coffee, and restroom) to ensure that sparks do **not** start a fire.
- Fire watches include the entire hot work area.
- Additional personnel are assigned as fire watchers when hot work is conducted in areas with vertical or horizontal fire exposures that are **not** observable by a single individual to ensure that all exposed areas are monitored.



Fire watchers shall:

- Ensure they have all required training.
- Ensure they have the appropriate fire extinguishers and be annually trained. /li>
- Be familiar with the operation of fire alarms.



- Be able to activate an alarm in the event of a fire.
- Warn operators if hazardous conditions develop.
- Be cognizant of the surroundings to ensure facility safety and property protection.
- Provide for the safety of the operator by carefully observing the operator for clothing fires that may go unnoticed by the operator who is focusing on the hot work task.

During an emergency or if instructed to do so, Operators and Fire Watchers shall:

- Shut down all hot work operations.
- Evacuate the building.
- Report immediately to a Security Officer or the Incident Commander the exact location and state of the hot work operation.
- **Not** re-enter the building until authorized to do so by emergency response personnel.



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [hot work](#) operations include:

Hazard	Reference
Equipment that has stored energy.	Section 4C , "Lockout/Tagout (LOTO)."
Confined space.	Section 6I , "Confined Space Entry."
Toxic gases, vapors, or fumes that may be generated during welding, cutting, brazing, and soldering operations.	Consult the appropriate Division ES&H Team for guidance on ventilation and respiratory protection requirements. Section 6C , "Respiratory Protection."

Pressure or vacuum.	Section 4D , "Pressure Safety Operations"
A number of potentially hazardous material incorporated into fluxes, coatings, coverings, and filler metals.	Section 6D , "Hazard Communication Standard," for labeling requirements for fluxes, coatings, coverings, and filler metals that are transferred to a secondary container. (The manufacturers of this material have strict labeling requirements placed on them).
Explosives safety.	Chapter 9 , "Explosives Safety."
Fire safety.	Chapter 5 , "Fire Protection."
Personal protective equipment (PPE).	Section 4L , "Personal Protective Equipment (PPE)."
Fall prevention, fall protection.	Section 4G , "Fall Prevention/Fall Protection."

*REFERENCES

*Requirements Source Documents

[29 CFR 1910, Subpart I](#), *Personal Protective Equipment*.

[29 CFR 1910.251](#), *Definitions*.

[29 CFR 1910.252](#), *General Requirements*.

[29 CFR 1910.253](#), *Oxygen-Fuel Gas Welding and Cutting*.

[29 CFR 1910.254](#), *Arc Welding and Cutting*.

[29 CFR 1910.255](#), *Resistance Welding*.

[29 CFR 1926 Subpart J](#), *Welding and Cutting*.

International Fire Code, International Code Council, *International Fire Code*. Falls Church, VA (2006).

Implementing Documents

SNL, [MN471000](#), *Pressure Safety Manual*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents



ANSI Z49.1-1994, *Welding, Cutting and Allied Processes, Safety*.

ANSI Z87.1-1989, *Practice for Occupational and Educational Eye and Face Protection*.

ANSI/AWS F4.1-94, *Recommended Safe Practices for the Preparation for Welding and Cutting of Containers that Have Previously Held Hazardous Substances*.

NFPA 51B, *Cutting and Welding Processes*.

NFPA 480, *Storage, Handling, and Processing of Magnesium Solids and Powders*.

NFPA 481, *Production, Processing, Handling, and Storage of Titanium*.

NFPA 482, *Production, Processing, Handling, and Storage of Zirconium*.



NFPA 485, *Storage, Handling, Processing, and Use of Lithium Metal*.

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ES&H Manual

SECTION 4C - LOCKOUT/TAGOUT (LOTO)

Subject Matter Expert: [Ralph Fevig](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue P

Revision Date: [September 7, 2006](#), Replaces Document Dated: March 15, 2006

Review Date: March 13, 2006

Administrative Changes: November 10, 2006, November 20, 2006 and [January 25, 2007](#)

*Indicates a substantive change



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 - [4C-1](#) – LOTO Catalog
- Tools
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 - [Removal of Lock by Other Than Owner](#)
 - [Lockout/Tagout Self-Assessment Tool](#)
 - [Tool for Performing Periodic Review of LOTO Procedures](#)
 - [Annual Lockout/Tagout \(LOTO\) Roles and Responsibilities for Authorized Workers \(LTO 220\)](#)



APPLICABILITY AND SCOPE

This section applies to all [Members of the Workforce](#) identified as [authorized workers](#) who perform service or maintenance activities on machines and equipment in which the unexpected energization or start-up of the machines or piece of equipment, or release of stored energy could cause injury to an individual. This section establishes performance requirements for the control of such hazardous energy. [See the Safety Engineering Program, LOTO Website for additional information.](#)

Exemptions

The following activities are **not** covered by or subject to this section:

- Minor tool changes and adjustments, and other minor servicing activities, that take place during normal production operations, if the activities are routine, repetitive, and integral to the use of the equipment for production, provided that the activities are performed using alternative measures that provide the same level of effective protection as LOTO.
- Work on single-energy-source cord- and plug-connected electrical equipment on which the exposure to hazardous energy is controlled by unplugging the equipment from the source and the plug remains in the exclusive control of the authorized worker.

ROLES AND RESPONSIBILITIES

Management

Management shall ensure that:

- Activities performed by their organizations are evaluated to determine the applicability of LOTO General Requirements (see "[General Requirements](#)").
- LOTO devices are provided for activities that meet the General Requirements.

- Procedures are written that implement LOTO requirements, as appropriate (see [“Written LOTO Procedures”](#) and [“Shift or Personnel Changes Procedure”](#)).
- [Members of the Workforce](#) performing activities requiring LOTO are designated as [authorized workers](#).
- An authorized worker is assigned primary responsibility for a set number of [authorized workers](#) working under the protection of a group LOTO device(s) (see [“Group LOTO Procedure”](#)).
- A self-assessment is performed in accordance with [Section 22A](#), “ES&H Self-Assessment Activities.”



Note: The optional “Lockout/Tagout Self-Assessment Tool” is provided to assist with any LOTO self-assessments.

- Periodic Inspections (as appropriate) are performed (see [“Periodic Inspections of Energy Control Procedure”](#)).

Note: LTO230 can be used to track Periodic Inspections.

- The following records are retained by their organizations in accordance with the [Sandia Records Retention and Disposition Schedule](#):
 - Lists of [authorized workers](#).
 - Periodic inspection records.
 - Training records.
- Whenever outside servicing contractor personnel are to be engaged in activities that meet the requirements of LOTO, Members of the Workforce and outside servicing contractor personnel shall:
 - Inform each other of their respective LOTO procedures.
 - Ensure that all individuals involved in the activity understand and comply with the restrictions and prohibitions of the hazardous-energy-control

procedures applicable to the activities being performed.

Members of the Workforce - Training

 Members of the Workforce who are authorized workers shall:


- Complete the following training.
 - [LTO210](#), LOTO for Authorized Workers (every 3 years).
 - [LTO220](#), LOTO Annual Roles and Responsibilities (at least once per year).

Note: Instructions for completing the training are provided in the TEDS training description; there is also an [optional documentation tool for LTO220](#).

- [LTO230](#), (at least once per year).
- Follow general requirements and procedures (see "[General Requirements](#)" and "[Procedures](#)").
- Apply or remove only their own locks and tags when performing LOTO or around other individuals who are performing LOTO.
- Keep keys to LOTO locks under personal control at all times.
- Perform periodic inspections, as assigned by management.

GENERAL REQUIREMENTS

The following standardized locks and tags shall be used and obtained:

- 
- Red banded Master® locks
 - Sandia lock labels
 - Sandia-specified "Danger" tags

- Single key

LOTO devices shall **not** be used for administrative control (see CPR400.1.1.7/[GN470037](#), *Administrative Control Procedure*).

*PROCEDURES

Performing LOTO Procedure

The following optional tools are provided to aid in the completion of the LOTO Procedures:

- [LOTO Checklist](#) – provides a checklist to ensure that the steps below are completed.
- [Equipment-Specific LOTO Procedure](#) – this optional template provides aids to identify the scope of the work, assess the hazards, identify LOTO points, authorized workers, and other useful items. Includes a portion of the Basic LOTO Checklist.

[Authorized workers](#) or managers, as appropriate, shall perform activities associated with LOTO as follows:

Step	Action
Step 1: Prepare for shutdown	<ul style="list-style-type: none"> • Before an authorized worker turns off a machine or piece of equipment, the authorized worker shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy. • Affected workers shall be notified by their manager or the authorized worker of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after the controls are removed from the machine or piece of equipment.



Step 2: Shutdown machine or piece of equipment	Authorized workers shutdown the machine or piece of equipment by normal means.
--	--

Step 3: Isolate machine or piece of equipment	Physically locate all energy-isolating devices needed to control the Hazardous Energy Source(s). Operate these devices in such a manner as to isolate the machine or piece of equipment from the energy source(s).
--	--

Step 4: Apply LOTO device	Authorized workers assure: <ul style="list-style-type: none">● Lockout includes the placement of the LOTO lock and tag, and may include other energy-isolating devices.● Lockout devices shall be affixed at each energy-isolating device (e.g., valve, breaker, disconnect).● Lockout devices, wherever used, shall be affixed in a manner that will hold or ensure that the energy-isolating device is in a safe or "off" position.● Tagout devices used in place of lockout devices are only used when the energy-isolating device is not capable of being physically locked out. A tag used without a lock shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by using a lock. Consult with the LOTO subject matter expert (SME) for assistance.
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Step 5: Release all stored energy



- Following the application of LOTO devices to energy-isolating devices, relieve, disconnect, restrain, and otherwise render safe all potentially hazardous stored energy or residual energy.
- If there is a possibility of re-accumulation of stored hazardous energy, verify the isolation while the service or maintenance activity is underway or until the possibility of such accumulation no longer exists.

Step 6: Verify energy isolation

Prior to starting work on a machine or piece of equipment that has been locked out or tagged out, verify that the machine or piece of equipment has been isolated and de-energized.

Perform work

Perform work activities.

Step 7: Release from LOTO



- Make work area safe.
- Clear tools, equipment, additional [authorized workers](#), and affected workers:
 - Inspect the work area to ensure that nonessential items have been removed and assure that the machine, piece of equipment, and/or components are operationally intact.
 - Inspect the work area to ensure that all Members of the Workforce have been removed from the hazard area.
- Remove locks and tags:
 - Each LOTO device shall be removed from each energy-isolating device by the authorized worker who applied the device.
 - When the authorized worker who applied the LOTO device is not available to remove it, that device may be removed in accordance with the following steps (removal shall be documented as described in



organization-specific documentation (see "[LOTO Removal of Lock by Other than Owner](#)"):

- Verify that the authorized worker who applied the device is not at the site.
 - Notify management and obtain management authorization to remove the device.
 - Make all reasonable efforts to contact the authorized worker regarding the removal of his LOTO device.
 - Ensure that the authorized worker has been informed of the removal of the device before resuming work activities at the facility. **Note:** Voicemail and/or email alone are not adequate means of notification.
- After LOTO devices have been removed and before a machine or piece of equipment is started, notify affected workers that the LOTO device(s) has been removed.
 - Authorize the restart of the machine or piece of equipment by normal means or proceed to "[Testing or Positioning of Machines, Equipment, or Components Procedure](#)."
 - Re-energize:
 - Authorize the restart of the machine or piece of equipment by normal means, or proceed to "Testing or Positioning of Machines, Equipment, or Components Procedure."

Testing or Positioning of Machines, Equipment, or Components Procedure

If a LOTO device is temporarily removed from the energy-isolating device and the machine or equipment must be energized for testing or positioning then [Authorized workers](#) shall complete the following steps before returning it to service.

Step	Action
Step 1: Clear tools, equipment, and personnel	<ul style="list-style-type: none"> ● Inspect the work area to ensure that nonessential items have been removed and to ensure that the machine, piece of equipment, or component is operationally intact. ● Check the work area to ensure that all Members of the Workforce have been removed from the hazard area.
Step 2: Remove locks and tags	Remove LOTO devices used during the application.
Step 3: Energize	Energize and proceed with testing or positioning.
Step 4: Re-apply LOTO	Re-apply all LOTO devices used during the application.

Group LOTO Procedure

When groups of [authorized workers](#) do **not** apply individual locks and tags to each energy source, a group LOTO procedure as outlined below shall be performed to ensure that each authorized worker has a level of protection equivalent to that obtained by the use of a personal LOTO device. In addition to the requirements of the "[Performing LOTO Procedure](#)," groups of authorized workers shall perform the following steps:

Step	Action

Step 1: Ensure de-energization, isolation, lockout or tagout, and zero energy state



- All hazardous energy sources are de-energized, isolated, locked out and tagged out, as appropriate, and zero energy state is verified.
- Each authorized worker working under the protection of a group LOTO device has the right to verify that the hazardous energy has been isolated and de-energized.
- A verification system is implemented to ensure that the continued isolation and hazardous energy sources are de-energized during maintenance and servicing operations. All energy sources are de-energized, isolated, locked out and tagged out, as appropriate, and zero energy state is verified.

Step 2: Affix LOTO devices



Each [authorized worker](#) affixes a personal LOTO device to the group lockout device, group lockbox, or comparable mechanism before work is initiated.

Note: The authorized worker responsible for coordinating the group LOTO activity shall also apply his lock to the LOTO device

Step 3: Release from LOTO



- Each [authorized worker](#) shall remove his personal LOTO device from the group lockout device or lockbox when work is completed on the machine or piece of equipment being serviced or maintained.
- When all locks on the group lockout device or lockbox have been removed, then those authorized workers who placed locks or devices on the hazardous energy sources remove their personal LOTO device from the machine or piece of equipment being

	serviced or maintained.
Step 4: Notify affected workers	<ul style="list-style-type: none"> • Notify affected workers that the LOTO device (s) has been removed after LOTO devices have been removed and before a machine or piece of equipment is started. • Authorize the restart of the machine or piece of equipment by normal means or proceed to “Testing or Positioning of Machines, Equipment, or Components Procedure.”

Shift or Personnel Changes Procedure

Specific procedures shall be written and implemented during shift or personnel changes to ensure the continuity of LOTO protection and to minimize exposure to hazards from the unexpected energization or start-up of the machine or piece of equipment, or the release of stored energy, including provisions for the orderly transfer of LOTO device protection between off-going and oncoming [authorized workers](#).

Periodic Inspections of Energy Control Procedure

An inspection of written LOTO procedures (as applicable) used more than once a year, shall be performed at least annually by an authorized worker who does not use the specific LOTO procedure being inspected. Procedures used less than once a year shall be inspected before they may be used again. The inspection is intended to determine whether the procedure is (1) adequate, (2) understood, and (3) being followed.

An optional tool for performing [Periodic Inspections of Lockout and Tagout](#) is available for documenting the periodic inspections described in this section. It provides written documentation that all requirements contained in this section are met, and identifies those workers authorized to perform LOTO in a specific energy control procedure.

The authorized worker shall perform periodic inspections of the Energy Control Procedure as follows:

Step	Action
Step 1: Observe	Observe the procedure being performed by a representative sample of authorized workers .
Step 2: Identify	Identify and provide corrections for deviations from the procedures and inadequacies in the procedure, if any. Note: Significant deviations require retraining of all authorized workers who use the procedure under review.
Step 3: Review roles and responsibilities	Review roles and responsibilities with authorized worker(s) as outlined under the topic, " Roles and Responsibilities ."
Step 4: Record results	The following shall be recorded for the inspection: <ul style="list-style-type: none"> ● Description of machine or piece of equipment on which the LOTO procedure was used. ● Date of inspection. ● Identification of the participants involved with the procedure. ● Identification of inspector. ● The results of the inspection (e.g., deviations, inadequacies, good work practices, corrective actions, and recommendations).
Step 5: Maintain records	Maintain records according to management direction and the Sandia Records Retention and Disposition Schedule .

Written LOTO Procedure

An equipment-specific procedure shall be written if **any of the** eight conditions below are **not** met:

1. The machine or piece of equipment has no stored, residual, or re-accumulated hazardous energy after shutdown.

2. The machine or piece of equipment has a single hazardous energy source that is readily identified and isolated.
3. The machine or piece of equipment, when isolated and locked out, is completely de-energized and deactivated.
4. The machine or piece of equipment remains isolated during service and maintenance.
5. Only one LOTO device is needed to lock out the equipment.
6. Authorized Worker(s) has exclusive control of the LOTO device.
7. The work does not create hazards for other workers
8. No previous accidents have occurred with the equipment during service or maintenance.

Note: LOTO activities will not extend beyond the shift of the authorized worker who applied LOTO. A single procedure may be written for multiple pieces of similar equipment or systems to be serviced, as appropriate. Consult with [LOTO SME](#) for assistance.

While the written LOTO procedure may take any form (e.g., a Technical Work Document [TWD] or Electrical Work Permit), the optional [Equipment-Specific LOTO Procedure \(ESLP\)](#) template is provided to help develop the procedure. The ESLP template includes instructions for use. The ESLP template is suitable for use any time LOTO is applied.

The "Written LOTO Procedure" shall include the following sections and information:

Scope, Purpose, and Authorization:

- A statement of intended use of the procedure.
- Identification of the equipment or systems to which the procedure applies.
- Provision for the appropriate management authorization for the procedure.

The procedural steps must address the following items:

- Shutting down.
- Isolating.
- Blocking and securing techniques and devices.
- Placing lockout and tagout devices.
- Verifying the zero-energy state.
- Removing LOTO devices.
- Returning to service or maintenance after testing.
- Transferring LOTO devices and responsibilities during shift changes, as appropriate.

Note: In most cases, completing the optional [Equipment-Specific LOTO Procedure \(ESLP\)](#) form will satisfy the requirements of this procedure. Consult with [LOTO SME](#) for assistance.

RELATED HAZARDS AND ACTIVITIES

Hazard or Activity	Reference
Electrical safety	Section 4B , "Electrical Safety Practices"
Pressure safety	Section 4D , "Pressure Safety Operations"
Cranes, hoists, and elevating work platforms	Section 4J , "Material Handling - Cranes, Hoists, and Forklifts"
Personal protective equipment (PPE)	Section 4L , "Personal Protective Equipment (PPE)"
Machines and tools	Section 4N , "Industrial Machine and Portable Power Tool Safety"
Lasers	Section 6G , "Lasers and Intense Light"
Confined spaces	Section 6I , "Confined Space Entry"
Local exhaust ventilation systems	Section 6P , "Local Exhaust Ventilation (LEV)"
Administrative controls	CPR400.1.1.7/ GN470037 , "Administrative Control Procedure"

REFERENCES

Requirements Source Documents

[29 CFR 1910.147](#), *The Control of Hazardous Energy (Lockout/Tagout)*.

Related Documents

ANSI/NFPA 70E, *Electrical Safety Requirements for Employee Work Places*, 2000 Edition.

ANSI/ASSE Z244.1-2003, *Control of Hazardous Energy*.

[29 CFR 1910, Subpart O](#), *Machinery and Machine Guarding*.

[29 CFR 1910.269](#), *Electric Power Generation, Transmission, and Distribution*.

[29 CFR 1910.333](#), *Selection and Use of Work Practices*.

[29 CFR 1926.417, Lockout and Tagging of Circuits.](#)

[DOE O 5480.19, Chg 2, Conduct of Operations Requirements for DOE Facilities.](#)

[DOE-STD-1030-96, Guide to Good Practices for Lockouts and Tagouts.](#)

[Safety Engineering Program, LOTO website](#)



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ES&H Manual


*SECTION 6Q – NANOMATERIALS

Subject Matter Expert: [Michael C. Oborny](#); CA Counterpart: [Daniel Kuey](#)

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*Indicates a substantive change

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- [Applicability](#)
 - [Training](#)
 - [Nanomaterials](#)
 - [Handling Nanomaterials](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:


- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to all activities on [Sandia-controlled premises](#) involving the use of [nanomaterials](#) or [nanoparticles](#). Additional requirements for working with chemicals are contained in [Section 6D](#), "Hazard Communication Standard" and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan."

TRAINING


Requirements



Members of the Workforce whose activities involve the use of nanomaterials shall complete either Laboratory Standard ([LAB100/LAB103](#)) or HAZCOM ([HAZ101/HAZ103](#)) training and any other training required for the hazards related to their specific activities. The manager shall determine the appropriate training requirements by consulting the references provided in [Related Hazards and Activities](#) for nanomaterials. In addition, all Members of the Workforce, including managers, are strongly encouraged to consult the Industrial Hygienist on their [Division ES&H Team](#) to discuss any health and safety concerns associated with the specific nanomaterials that they are handling.

NANOMATERIALS

Requirements



Managers responsible for areas or activities where [nanomaterials](#) are handled shall be responsible for ensuring that:

- Hazards associated with the use of nanomaterials are identified, evaluated and controlled.
- Members of the Workforce are informed of the hazards associated with the nanomaterials present in the work area.
- Required [engineering controls](#) such as chemical fume hoods and local exhaust ventilation systems are installed and maintained for utilization when required.
- Required [personal protective equipment](#) is available and used when required.

Members of the Workforce shall:

- Be aware of the hazards associated with the nanomaterials present in their workplace.
- Follow applicable procedures when working with nanomaterials, including the use of required personal protective equipment.
- Ensure that engineering controls such as chemical fume hoods and local exhaust ventilation systems are utilized when required.
- Consult the [facilities support](#) contact for assistance with adjustments, maintenance, and repair of ventilation systems and other building related equipment.

Guidance

Nanomaterials incorporating engineered [nanoparticles](#) or nanoscale features exhibit unique properties that affect their physical, chemical and biological behavior. Typical nanomaterials that may be encountered at Sandia National Laboratories include: nanotubes, nanofibers, fullerenes (“buckyballs”), dendrimers, quantum dots, metal and metal oxide nanoparticles, and composite materials that include nanoparticles or nanofibers as one or more ingredient.

Occupational exposure to nanomaterials may occur through inhalation, dermal contact, and ingestion. Animal studies indicate that low-solubility [ultrafine particles](#) may be more toxic than larger particles on a mass-for-mass basis. Because of their tiny size, nanoparticles can penetrate deep into the lungs and may translocate to other organs following pathways not demonstrated in studies with larger particles.

From a safety perspective, the nanoparticulate forms of some materials show unusually high reactivity for fire, explosion and catalytic effects. Consequently, these materials may initiate reactions that would not be otherwise anticipated from their chemical composition.

Due to the wide variety of nanomaterials, no blanket recommendations can be made regarding the health and safety risks for all nanomaterials. Consequently, health and safety risks should be evaluated on a case-by case basis considering any precursor, intermediate, by-product and waste materials.

HANDLING NANOMATERIALS

Requirements

Although there is a lack of specific guidance on evaluating and controlling the risks posed by [nanomaterials](#), preliminary research suggests that some of the controls used in conventional laboratory settings are effective for nanomaterials. Based on this preliminary research, the following guidelines shall be followed when handling engineered nanomaterials:

- Use good general laboratory safety practices. Wear lab coats, safety glasses, and face shields as needed.
- Do not allow [nanoparticles](#) to contact bare skin. Wear nitrile gloves to avoid skin contact when handling nanoparticles and nanoparticle-containing solutions. Gloves should be changed on a daily basis or if they become contaminated.
- Good hand washing practices and housekeeping shall be maintained around nanomaterial work areas.
- All operations involving dispersible nanoparticles must be carried out in a [designated area](#). A designated area may be the entire laboratory, an area of a laboratory or a containment device such as a chemical fume hood or glove box. The designated area shall be posted to indicate the hazards and required personal protective equipment or administrative controls for handling nanoparticles within the designated area.
- Use engineering controls such as fume exhaust hoods, negative pressure enclosures, or local exhaust ventilation systems when working with dispersible nanoparticles or nanomaterials that will generate dispersible nanoparticles during normal handling.
- If engineering controls are not used, use N, P, or R100 ([HEPA](#)) particulate respirators for respiratory protection when working with dispersible nanoparticles or nanomaterials that will generate dispersible nanoparticles during handling.
- Use fume exhaust hoods or local exhaust ventilation systems to expel fumes from tube furnaces or chemical reaction vessels.

- Use a HEPA vacuum or wet wiping methods for cleaning of work areas or spills involving nanoparticles and nanoparticle-containing solutions. Dry sweeping or air hoses should not be used to clean work areas.
- Dispose of all nanomaterials and any contaminated items, such as gloves and HEPA cartridges, in accordance with Sandia chemical disposal requirements. Contact your [Division ES&H Team](#) Environmental Compliance Coordinator or [Center ES&H Coordinator](#) for assistance.
- Equipment used to handle nanomaterials shall be evaluated for potential contamination prior to repair, reuse, or disposal. Contact your [Division ES&H Team](#) Industrial Hygienist for an industrial hygiene review.



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [nanomaterials](#) include:

Hazard/Activity	Reference
Workplace exposure to chemicals during chemical-related work	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Chemical Information System (CIS)	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Labeling and disposal of hazardous waste	Chapter 10 , "Environmental Protection" Section 19A , "Hazardous Waste Management"
Design, installation and use of local exhaust ventilation (LEV) equipment to control nanomaterial hazards	Section 6P , "Local Exhaust Ventilation (LEV)"

Respiratory protection for inhalation hazards	Section 6C , "Respiratory Protection"
Protective equipment and clothing	Section 4L , "Personal Protective Equipment (PPE) "

REFERENCES

Requirements Source Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

American Conference of Governmental Industrial Hygienists (ACGIH), 2006 TLVs ® and BEIs ®: *Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices*, Cincinnati, OH, 2006 or latest edition.

[DOE/EH-0673](#), *Safety & Health Bulletin: Good Practices for Handling Nanomaterials*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[DOE P 456.1](#), *Secretarial Policy Statement on Nanoscale Safety*.

Implementing Documents

SNL, [PG470019](#), SNL/NM Industrial Hygiene Program.

SNL, [PG470196](#), SNL/CA Industrial Hygiene Program.

SNL, [PG470218](#), Worker Protection Program (WPP).

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ES&H Manual

***SECTION 18B – SAFETY ENGINEERING ACCIDENT INVESTIGATION (AI) PROCESS**

Subject Matter Expert: [Ralph Fevig](#); CA Counterpart: N/A

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APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce on [Sandia-controlled premises](#).



INTRODUCTION

This accident investigation process has been developed to ensure, that when deemed necessary by both ES&H and line management, certain accidents/injuries and/or near misses are thoroughly investigated following a prescribed and formal series of actions. The purpose of this process is to add formality and uniformity to accident and near miss investigations that may occur on [Sandia-controlled premises](#) or involve Sandia employees or contractors. In addition this process is developed to ensure that accident investigations are free from any undue influence and conflict of interest. This process immediately follows that described in *ES&H Manual* Section 18C, "Occurrence Reporting," [Attachment 18C-3](#). It is not intended that this process be used for the majority of accidents and injuries, but just for those identified by the ES&H Center Director or Line Center Director for formal accident investigation.



*SCOPE

This accident investigation process is documented for use when accidents/injuries and/or near misses occur on [Sandia-controlled premises](#) or involve Sandia employees or contractors. This process should be utilized when line management and ES&H management determine that an accident/injury or near miss investigation requires a high level of rigor utilizing the methods outlined by [DOE G 225.1A-1, Implementation Guide for use with DOE Order 225.1A, Accident Investigations](#).

Note: For information on the accident investigation process for injuries and illnesses that are deemed not to require this level of rigor, see the topic below, "[Typical Injury/Illness Accident Investigation Process](#)," for a description of the process.



Requirements

- The Safety Engineering Department owns this process and the Subject Matter Expert (SME) shall be responsible for changes and updates made to this document.
- [Corrective actions](#) that are developed and recommended by the accident investigation team will be owned and funded by the accident owning line organization.
- The accident owning line organization shall be responsible for all costs incurred for the time and other support activities required to conduct the investigation and produce the report.



TRAINING

Requirements

All Members of the Workforce who are appointed accident investigators shall complete accident investigation training prior to participation as an investigator.

RESPONSIBILITIES

Requirements

The Line Director Shall:

- Appoint the accident investigation chairperson and members of the team.
- Approve the final report.
- Submit the final report to the Center ES&H director.

The Safety Engineering Department shall:

Appoint a pool of accident investigators for any investigations that require use of this process. In the event that there are ES&H Subject Matter Experts (SMEs) that have completed the accident investigation training, they may be asked to participate as the appointed accident investigator if the nature of the accident is directly related to the SMEs field of expertise.

The appointed accident owning line organization shall:

- Participate as required by this process.
- Incur all costs associated with the investigation.
- Recommend corrective actions, as applicable.

The accident investigation chairperson shall:

- Communicate accident investigation specifics to the appointing line organization Director and Director of ES&H.
- Oversee all activities of the team.
- Avoid undue influence and conflict of interest in the accident investigation process by implementing the accident investigation team composition process in this document.

The appointed accident investigator shall:

- Ensure that current [accident and investigation tools and methodologies](#) are employed and adhered to.

The accident investigation team members shall:

- Collect and analyze accident information.
- Derive conclusions regarding causal factors.
- Identify judgments of need as defined in the DOE Workbook, *Conducting Accident*

investigations, [Section 8](#), “Developing Conclusions and Judgments of Need.”

- Develop the accident investigation report content.

The advisors and consultants shall:

- Provide technically accurate information and guidance to the team for the areas of investigation that require technical interpretation (e.g., physicists or chemists).

The technical writer shall:


- Review the draft and final reports to ensure grammatical consistency with current Sandia standards and may support the accident investigation team in standardizing the content.

ACCIDENT INVESTIGATION (AI) TEAM COMPOSITION

Requirements


The accident investigation team shall consist of the following:

- Chairperson – shall be a Department Manager or above who is knowledgeable in the type of process, operations, or facility and work where the accident occurred. The chairperson shall not be from the accident owning organization.
- Accident investigator – shall be an individual who has been appointed by the Safety Engineering Manager.
- Team members – shall be Members of the Workforce who understand the type of process, operations, or facility and work that is involved in the accident; team members cannot participate in accident investigations that occur in their organization; a supervisor and subordinate shall never be part of the same accident investigation team; and two to five team members are recommended, not including the chairperson and trained accident investigator.

- 
- Advisors and consultants – shall be those Members of the Workforce who have the special skills or process knowledge necessary to conduct a complete and thorough accident investigation.
 - Technical writer – shall be someone who can review the draft and final reports to ensure grammatical consistency with current Sandia standards and can support the accident investigation team in standardizing the content.
-

RESPONSE

Requirements



The line management and ES&H management determines that an accident/injury or near miss warrants an investigation and makes the request for a formal accident investigation to commence. This is the preliminary investigation phase for an accident/injury or near miss. The formal investigation will begin no later than five days from the formal request to conduct an investigation. It is understood that a preliminary investigation will already be underway that includes safety engineering and the responsible line organization Members of the Workforce. The preliminary accident investigation information shall be provided to the formal accident team team within 3 working days of the formal request. The investigation should be completed within 45 days with the report to be issued to the accident owning line organization within 10 working days after completion of the investigation.

CRITERIA FOR INVESTIGATION



Guidance

Accidents/injuries or near misses that meet the criteria for this investigation process have occurred and have resulted in or have the potential for the following:

- Injury or illness, property damage, damage to the environment, or release of radioactive materials that do not meet the Type A or B criteria as defined in *ES&H Manual* Section 18C, “Occurrence Reporting,” [Attachment 18C-1](#).

- Damage to DOE or Sandia's reputation.
- Occurrence in the functional areas scheduled by DOE/SNL for annual assessment (e.g., electrical safety and LOTO).



INVESTIGATION TECHNIQUES/TOOLS

Guidance

The following analytical techniques, per [DOE G 225.1A-1](#) *Implementation Guide for use with DOE Order 225.1A, Accident Investigations*, should be used to conduct the accident investigation:

- Core Analytical Techniques:
 - Barrier Analysis (section 4.4.1 of the above document).
 - Change Analysis (section 4.4.2 of the above document).
 - Events and Causal Factors Charting and Analysis (section 4.4.3 of the above document).



For additional information on analytical techniques, see the DOE Implementation Guide.

ROOT CAUSE ANALYSIS

Guidance

A root cause analysis (RCA) should be performed as a part of the accident investigation process [see *ES&H Manual*, [Section 22B](#), Root Cause Analysis (RCA)]. A recognized formal RCA method or combination of methods may be used for analysis including: Tap Root, Apollo, DOE or Sandia.



ACCIDENT INVESTIGATION REPORT

Guidance

The accident investigation report should be developed using the guidelines for format and content stated in the DOE Workbook, *Conducting Accident investigations*, [Section 9.0](#), "Reporting the Results."







*TYPICAL INJURY/ILLNESS ACCIDENT INVESTIGATION PROCESS

See the [accident investigation](#) website for further information and tools to assist in performing an accident investigation.

*Requirements

All MOW shall follow the steps below for this process:

- 
- A Member of the Work Force (MOW) who has been injured or incurs an occupational illness shall report the incident to management immediately. Of course, in an emergency, a fellow worker can make emergency notifications.
 - The accident scene shall not be disturbed, except to take actions to render it safe, until management and/or the investigating safety engineer decides if it shall be maintained "as is" in order to permit a thorough investigation.
 - The manager shall perform an OOPS notification for all injuries and illnesses. The OOPS Process and its emergency and non-emergency reporting phone numbers are listed on the [OOPS website](#).
 - The injured MOW shall report to Health Services during operational hours to provide information to complete SF-2050-P, "Report of Occupational Injury/Illness."

- 
- The 2050P form shall be forwarded electronically to the Safety Reporting Administrator who makes the determination as to whether it is a work-related case.
 - The manager receives a notification that one of his employees has had a non work-related injury. No further action is required if not work-related.
 - It shall be forwarded to the manager for his statement on the incident if not work-related. The manager needs to first interview the Member of the Work Force. The manager should visit the accident scene and provide as much information as possible on what the employee was doing and the circumstances of the accident in his statement. Use the Minimum Set of Expectations and Requirements on the Injury/Illness Program website and the ISMS Wheel Investigation tool found on the ES&H Accident Investigation website to assist in performing the investigation. When possible, the manager and safety engineer/IH should work together to investigate the accident.
 - The appropriate ES&H Professional shall be notified by the Safety Reporting Administrator of a work-related injury in their division. The ES&H Professional will then be required to perform the injury/illness investigation for completion of the DOE F 5484.3. The investigation results shall include an accident cause and appropriate corrective actions.
 - The DOE F 5484.3 shall be completed in the Incident Tracking System (ITS). The investigation helps the Safety Reporting Administrator make the final determination on OSHA recordability.
 - The senior manager receives an email that a recordable case has occurred in their organization if deemed an OSHA recordable case.
 - The senior manager completes an electronic Internal Management Notification form and submits it to the Lab Director. The Director of ES&H receives notification at the same time.
 - The Internal Management Notification form is reviewed by Senior Management to determine if corrective actions are sufficient to correct any problems.
- 
- 

*REFERENCES

Related Documents

[DOE O 225.1A](#), *Accident Investigation*.

[DOE G 225.1A-1](#), *Implementation Guide for use with DOE Order 225.1A, Accident Investigations*.

[DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*.

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ES&H Manual

SECTION 17B – AIR PERMITS

Subject Matter Expert: [Joanna Eckstein](#); CA Counterpart: [Lee Gardizi](#)

Contributor: [Timothy Stirrup](#)

MN471001, Issue J (I not used)

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* Indicates a substantive change

- 
- [Applicability](#)
 - [*Planning](#)
 - [*Permitting Process](#)
 - [*Preconstruction Permit](#)
 - [*Fugitive Dust Control/Demolition Permit](#)
 - [*Open Burn](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [17B-1](#) - Giving Notice
 - [*17B-2](#) - Getting a Permit
 - [17B-3](#) - Open Burn Notification
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose activities have the potential to emit any [regulated air contaminants](#) on [Sandia-controlled premises](#) in Bernalillo County, New Mexico.

For all other work activities that have the potential to emit any [regulated air contaminant](#) outside of Bernalillo County, New Mexico, consult the [air quality contact](#).

For work activities that have the potential to emit any [regulated air contaminant](#) at [Sandia-controlled premises](#) in California, consult the California [air quality contact](#).

*PLANNING

*Requirements

Prior to performing an operation or activity, or at any time during an activity, Members of the Workforce shall:

- **Consult with the air quality contact** to determine the need for a permit and give notice (see [Attachment 17B-1](#), "Giving Notice") if one or more of the following conditions exists:
 - During [preconstruction activities](#):
 - **Potential** emissions of a [regulated air contaminant](#) at a rate greater than 2,000 pounds per year.
 - Potential emissions of a [regulated air contaminant](#) at a rate greater than 10 pounds per hour.
 - Emissions from an **electrical power** generator.

- Emissions from fossil fuel (e.g., natural gas, diesel) fired boilers.
 - Any chemicals classified as hazardous air pollutants (also see Chemical Inventory System).
 - Any potential radionuclide emissions (see Section 17E, "Radionuclide National Emissions Standards for Hazardous Air Pollutants [NESHAP]").
- For Fugitive dust control/demolition (formerly surface disturbance/demolition or topsoil) activities:
 - Disturbing greater than 3/4 acre of soil.
 - Demolishing more than 75,000 cubic feet of building space.

Note: Unpaved roadways within properties owned or controlled by DOE are exempt until March 1, 2007; however, this exemption only applies if the public does not have motor vehicle access to the roadways.

- Obtain the appropriate permits according to the requirements in Attachment 17B-2, "Getting a Permit," and:
 - Ensure that permits are always current.
 - Allow sufficient lead time to apply for new permits before existing permits expire.

Note: For calculation of emission rates and for guidance on permit applicability determination, consult the air quality contact.

*PERMITTING PROCESS

*Requirements

*Activities

Members of the Workforce responsible for complying with the conditions and requirements of a permit shall:

- Notify the [air quality contact](#) to initiate the permitting process or to modify an existing permit for any of the following types of air quality permits:
 - [Preconstruction.](#)
 - [Fugitive dust control/demolition.](#)
 - [Open burn.](#)
- Provide the following to the air quality contact, as applicable:
 - A brief description of the project.
 - Expected construction date.
 - Expected startup date.
 - Process parameters (e.g., hours of operation and material throughput).
 - Exhaust stack parameters, where applicable.
 - [List of chemicals with estimated annual usage/quantity.](#)
 - [List of all fuel burning equipment specifically including electrical power generators and boilers.](#)
 - Quantity and type of emissions, [if known.](#)
 - [Name plate boiler size in mmbtu per hour and fuel type.](#)
 - [Name plate generator size in hp per hour and fuel type.](#)
 - Any other supporting information.

*Documentation

- Members of the Workforce who have operations covered by an air quality permit shall:
 - Post a copy of the permit at the source location.
 - Collect and maintain all data required by the permit.
 - Complete all reporting requirements prescribed by the permit.
 - Keep a copy of the permit records for as long as the permit is in effect at the facility and in the appropriate organizational files.



*PRECONSTRUCTION PERMIT

*Requirements

Note: Preconstruction permits include registrations, authority-to-construct permits, radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) approvals, other NESHAP approvals (e.g., halogenated solvent cleaning machine/degreaser), New Source Performance Standard (NSPS) permits, and Prevention of Significant Deterioration (PSD) permits. [Fugitive Dust Control/Demolition Permits](#) are not included in the preconstruction permit process.

The responsible Members of the Workforce shall provide information to the [air quality contact](#) to enable completion of the [Source Registration and Authority-to-Construct Permit Form](#) and the [Gasoline or Diesel Internal Combustion Emergency Engine/Generator Permit Form](#).

*FUGITIVE DUST CONTROL/DEMOLITION PERMIT

*Requirements

Before conducting any fugitive dust generation or demolition activities that involve disturbance of more than $\frac{3}{4}$ of an acre or 75,000 cubic feet of demolition, Members of the Workforce who are responsible for these activities shall:

- Complete the Application for a Fugitive Dust Control Permit, and submit to the Air Quality Compliance Program Department 10333.
- The AQC Program Lead shall route the permit for appropriate signatures and submit the application and plan, with the necessary fee, to the City of Albuquerque's Environmental Health Department.
- The AQC Program Lead shall provide a copy of the approved Fugitive Dust Control/Demolition Permit to the responsible Member of the Workforce.

Note: For SNL/NM wind direction or speed information, see <http://132.175.200.42/> or contact Meteorologist ([air quality contact](#)).

*OPEN BURN

*Prohibited and Accidental Burning

*Requirements

Members of the Workforce shall:

- Extinguish accidentally ignited material that could result in an open burn as soon as possible after its discovery to minimize air emissions.
- Not perform environmentally nonessential burning in Bernalillo County.
- Not burn explosives or any other items considered and regulated as a hazardous waste subject to Section 19A, "Hazardous Waste Management," of the ES&H Manual unless an approved permit has been obtained for that purpose.

*Non-Permit Activities

*Requirements

Members of the Workforce shall:

- Notify the [air quality contact](#) according to the procedures in [Attachment 17B-3](#), “Open Burn Notification,” before performing any of the following non-permit activities:
 - Detonating 20 pounds (9 kilograms) or less of **non-waste** explosives.
 - Igniting rocket motors containing 4,000 pounds (1,818 kilograms) or less of fuel.
- Not perform these activities during "no burn" periods of the winter pollution advisory.

Note: For additional information, please call the City of Albuquerque's winter pollution advisory hotline at 768-BURN.

*Open Burn Permit


*Requirements

Members of the Workforce shall:


- Consult the [air quality contact](#) for assistance when planning to conduct a type of open burn not listed in [Planning](#).
- Obtain an open burn permit according to the requirements in the [Multiple or Single Event Open Burn Permit Form](#) before performing any of the open burn activities listed in the table below. This table has been adapted from [20.11.21 NMAC](#), Open Burning, and lists the activities most likely to be performed during operations or activities by Sandia organizations.

Purpose and Conditions of Burn	Permit Basis	
	Multiple Event	Single Event

Burns of less than 2,000 gallons (7,568 liters) per event of liquid fuel for research and development activities .	X	N/A
Burns of 2,000 gallons (7,568 liters) or more of liquid fuel for research and development activities.	N/A	X
Burns of less than 5,000 pounds (2,272 kilograms) per event of solid fuel for research and development activities.	X	N/A
Burns of 5,000 pounds (2,272 kilograms) or more of solid fuel for research and development activities.	N/A	X
Disposal by burning of explosives to avoid transport or handling hazards (see * Note, below).	X	N/A
Aboveground detonation of more than 20 pounds (9 kilograms) of explosives per event.	X	N/A
Aboveground detonation of more than 200 pounds (90 kilograms) of explosives.	N/A	X
Ignition of rocket motors containing more than 4,000 pounds (1,818 kilograms) but no more than 8,000 pounds (3,636 kilograms) of fuel.	X	N/A
Ignition of rocket motors containing more than 8,000 pounds (3,636 kilograms) of fuel.	N/A	X



Firefighter and rescue training (fuel and conditions appropriate for the activity). Do not burn environmentally poor burning substances unless essential to simulate the needed training conditions.	X	N/A
Timber and forest management for burns of less than 1/4 acre.	X	N/A
Timber and forest management for burns of 1/4 acre through 10 acres in size, or up to 1,000 cubic feet of pile volume per day.	N/A	X
Agricultural burning for burns of less than 1/4 acre.	X	N/A
Agricultural burning for burns 1/4 acre through 10 acres in size, or up to 1,000 cubic feet of pile volume per day.	N/A	X



Members of the Workforce who plan to conduct other open burn activities and are uncertain about whether a permit is required shall consult the [air quality contact](#). For some activities, it is possible to obtain a multiple-event permit, which allows a series of burns. Other activities (usually large-scale burns) require single-event permits.

***Note:** **Burning of explosives** may be considered and regulated as hazardous waste treatment subject to [Section 19A](#), "Hazardous Waste Management," of the *ES&H Manual*. **Additional permits may be required.**

*Open Burn Activities

*Requirements



Members of the Workforce shall notify the [air quality contact](#), DOE, and the Albuquerque Environmental Health Department (at 224-6977):

- At least 24 hours prior to performing an open burn, according to the procedure presented in [Attachment 17B-3](#), "Open Burn Notification."

- If a notified open burn is canceled, postponed, or rescheduled.

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Air emissions control measures	Section 17C , "Air Emissions Control Measures"
Radionuclide emissions	Section 17E , "Radionuclide National Emissions Standards for Hazardous Air Pollutants [NESHAP]"
Explosives	Section 19A , "Hazardous Waste Management"

REFERENCES

Requirements Source Documents

[20.11.2](#) NMAC, *Fees*.

[20.11.20](#) NMAC, *Fugitive Dust Control*.

[20.11.21](#) NMAC, *Open Burning*.

[20.11.40](#) NMAC, *Source Registration*.

[20.11.41](#) NMAC, *Authority to Construct*.

[20.11.64](#) NMAC, *Emission Standards for Hazardous Air Pollutants for Stationary Sources*.

Implementing Documents



[20.11.42](#) NMAC, *Operating Permits.*

[20.11.60](#) NMAC, *Permitting in Nonattainment Areas.*

[20.11.61](#) NMAC, *Prevention of Significant Deterioration.*

[20.11.63](#) NMAC, *New Source Performance Standards for Stationary Sources.*

[40 CFR 52](#), *Approval and Promulgation of Implementation Plans.*

[40 CFR 60](#), *Standards of Performance for New Stationary Sources.*

[40 CFR 61](#), *National Emission Standards for Hazardous Air Pollutants.*

[40 CFR 63](#), *National Emission Standards for Hazardous Air Pollutants for Source Categories.*

Rescission of Notice of Air Quality Violation, dated January 4, 1996.

Related Documents

[10 CFR 1021](#), *National Environmental Policy Act Implementing Procedures.*

[DOE O 450.1](#), *Environmental Protection Program.*



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ES&H Manual

SECTION 6R – INDOOR AIR QUALITY

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* Indicates a substantive change

- [*Applicability](#)
- [Symptoms of Potential Indoor Air Quality Problems](#)
- [*Reporting of Indoor Air Quality Concerns](#)
- [*Responsibility for Addressing Indoor Air Quality Problems](#)
- [*Preservation of Indoor Air Quality](#)
- [*Related Hazards and Activities](#)
- [*References](#)

*APPLICABILITY



For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities on [Sandia-controlled premises](#) involving potential [indoor air pollutants](#). This section does not apply to comfort concerns, such as temperature and draftiness. (Consult the [facilities support](#) contact.)

SYMPTOMS OF POTENTIAL INDOOR AIR QUALITY PROBLEMS

Guidance

Members of the Workforce should be aware that [indoor air quality](#) problems are the result of the build-up of [indoor air pollutants](#) to concentrations that affect the building's occupants. Indications of poor indoor air quality include stale or stuffy air, lingering odors, excessive dustiness, and indications of mold or mildew in the work area. The following symptoms experienced by occupants in the area of concern may also indicate poor indoor air quality:

- Upper respiratory irritation (e.g., itching eyes, coughing, sneezing)
- Congestion
- Headache, dizziness, and nausea
- Fatigue, listlessness, and inability to concentrate
- Shortness of breath

If Members of the Workforce do not experience symptoms when they are out of the area of concern, they should also consider this to be an indication of a potential indoor air quality problem.

Members of the Workforce should be aware that symptoms caused by indoor air quality problems are very general and can be attributed to other factors, including the following:

- Flu/cold
- Low humidity

- Sinus infections
- Allergies
- Poor work station design (e.g., glare, poor ergonomics)
- Job activities leading to eye fatigue, stress, or general fatigue

Members of the Workforce should take these factors into account when evaluating whether poor indoor air quality is the cause of the symptoms.




*REPORTING OF INDOOR AIR QUALITY CONCERNS

Guidance

Members of the Workforce should:

- Report [indoor air quality](#) concerns to the appropriate manager, [Division ES&H Team](#), or non-emergency hotline (844-6515 or 294-3724). If a potential emergency situation exists, Members of the Workforce should call the emergency hotline (844-0911 or 294-2300) or 911.
- Leave the area of concern before reporting a problem **if** they feel there is an immediate danger to their health or safety.
- Report symptoms that may be associated with an indoor air quality problem to the [Medical Clinic](#) contact.



Members of the Workforce should collect and provide information about the potential indoor air quality problem to [the Customer Support Team \(CST\) Industrial Hygienist \(IH\)](#) throughout the course of the investigation. This information can be very valuable to investigators, particularly with problems that are transient in nature. Examples of observations that should be made and recorded include:

- Location, time, duration, and frequency of the problem
- Specific symptoms being exhibited
- Any unusual operations in or near the affected area or outside air intakes
- Observations about the work area and associated odors and a description of unusual odors or excessive dustiness.
- Other information that might be useful in establishing a pattern for the problem, such as weather or problems with the air conditioning, heating, **room heaters or humidifiers**

Other common sources of indoor air quality problems that Members of the Workforce may easily identify include the following:

- Food
- Indoor plants
- Refrigerators and microwave ovens
- **Pests (rodents, insects, etc.)**
- Animals
- Waste cans that have not been emptied
- Restrooms
- Floor drains
- Accumulated dust
- Construction, maintenance, or custodial activities

***RESPONSIBILITY FOR ADDRESSING INDOOR**

AIR QUALITY PROBLEMS

Requirements

Managers shall address concerns regarding [indoor air quality](#) expressed by Members of the Workforce.

Note: Resources that may be helpful in addressing indoor air quality concerns are listed in "[Guidance](#)."



Guidance

Members of the Workforce should:

- Consult the [appropriate Division ES&H Team industrial hygienist contact](#) for assistance in evaluating indoor air quality and providing recommendations to correct identified problems.
- Consult the [facilities support](#) contact for assistance with adjustments, maintenance, and repair of building related equipment, including the building heating, ventilation, and air conditioning systems.
- Consult the [Medical Clinic](#) contact for [medical consultation](#) on potential indoor air quality related health concerns.



Managers should:

- Recognize that some Members of the Workforce may be more sensitive to indoor air quality pollutants than others.
- Contact the [Customer Support Team \(CST\) Industrial Hygienist \(IH\)](#) upon MOW concern regarding indoor air quality.

*PRESERVATION OF INDOOR AIR QUALITY



Guidance

Members of the Workforce should refrain from performing actions that might degrade [indoor air quality](#), such as:

- Allowing vehicles to idle in the vicinity of building fresh-air intakes **or near building entrances.**
- Conducting activities that generate vapors, fumes, or odors directly in the work area or in the vicinity of building fresh-air intakes.
- Introducing strong odors (e.g., odorous cleaning products; strong perfume, cologne, hairspray) into the work area.
- Making any unauthorized modification to any heating, ventilation, air conditioning (HVAC) system and local exhaust ventilation (LEV) system (consult the [facilities support](#) contact for adjustments).

Note: In cases where it is not feasible to prevent contaminants from entering air intakes, contact facilities support.

Members of the Workforce should, where practical, control emissions of potential indoor air quality pollutants at the source (see the appropriate [Division ES&H Team](#) and [Section 6P](#), "Local Exhaust Ventilation (LEV)" for more information).

*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [indoor air quality](#) include:



Hazard/Activity	Reference

Workplace exposure to chemicals during chemical-related work	Section 6D , "Hazard Communication Standard"
Problems with animals or animal droppings	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Chemical spills	Section 10E , "Chemical Spills"
Problems caused by inadequately or improperly functioning local exhaust ventilation (LEV) equipment	Section 6P , "Local Exhaust Ventilation (LEV)"

*REFERENCES

Requirements Source Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

American Conference of Governmental Industrial Hygienists (ACGIH), Committee on Bioaerosols, *Guidelines for the Assessment of Bioaerosols in the Indoor Environment*, Cincinnati, Ohio.

American Society of Heating, Refrigeration, and Air Conditioning Engineers, ASHRAE

Standards 62-1999, *Ventilation for Acceptable Indoor Air Quality*, Atlanta, Georgia.

American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), *Handbook of Fundamentals*, 1985.

Burton, D.J., *IAQ and HVAC Workbook*, IVE, Inc., Bountiful, Utah, 1991. Fanger, P.O., "The New Comfort Equation for Indoor Air Quality," *ASHRAE Journal*, October 1989, pp. 33-38.

EPA, *Building Air Quality: A Guide for Building Owners and Facility Managers*, December 1991.

National Institute for Occupational Safety and Health, Hazard Evaluations and Technical Assistance Branch, *Guidance for Indoor Air Quality Investigations*, Cincinnati, Ohio, 1987.

SNL, MN471019, *SNL/CA Office Safety Manual*, [Chapter 6](#), "Industrial Hygiene."

SNL, [PG470218](#), *Worker Protection Program (WPP)*.



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ES&H Manual

*SECTION 6Z – CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM

Subject Matter Experts: [Chad Hjorth](#); CA Counterpart: [Al Buerer](#)

MN471001, Issue B

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*Indicates a substantive change

- [Applicability](#)
- *[Training](#)
- *[Baseline Inventory](#)
- *[Operational Areas and Beryllium Activities](#)
- [Contaminated Buildings and Areas](#)
- [Hazard Assessment](#)
- [Exposure Limits, Action Limit, & Exposure Reduction and Minimization](#)
- [Regulated Areas & Hygiene Facilities and Practices](#)
- [Respiratory Protection](#)
- [Protective Clothing and Equipment](#)
- [Housekeeping](#)
- [Release Criteria](#)
- [Disposal](#)
- [Beryllium Emergencies](#)
- [Medical Surveillance, Removal, Consent and Counseling](#)
- * [Warning Signs and Labels](#)
- *[Record keeping and Use of Information](#)
- [Contamination Control](#)

- [Decontamination](#)
- [*Technical Work Documents](#)
- [Performance Feedback](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - [6Z -1](#) – Equipment Release Letter
 - [6Z -2](#) – Industrial Hygiene Building/Area Contamination Logic Flow Diagram
 - [6Z -3](#) – Industrial Hygiene Release of Equipment to General Public or Non-Beryllium Area Logic Flow Diagram



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

The Sandia National Laboratories Chronic Beryllium Disease Prevention Program is comprised of two documents: This *ES&H Manual* Section and document [PG470203 - Sandia National Laboratories Chronic Beryllium Disease Prevention Program](#). This Section addresses the specific requirements to be implemented by organizational management, [Members of the Workforce](#), all [contractors](#) involved in operations or activities that involve beryllium, as well as locations of beryllium contamination on [Sandia-controlled premises](#). The program document is administered by the Industrial Hygiene Program and it identifies how Sandia National Laboratories shall manage and control beryllium exposures.

This document applies to activities on [Sandia-controlled premises](#) involving past and/or present exposure, or the potential for exposure to [beryllium](#), and to the disposition and handling of [beryllium articles and beryllium contaminated equipment and other items](#). There are no restrictions associated with the procurement of beryllium articles; however, when possible beryllium articles should be avoided if there is a possibility they will be subjected to any abrasive or destructive tests that may result in the release of airborne



particulates resulting in potential **Member of the Workforce** exposure and/or [removable contamination](#).


This does not apply to natural sources of beryllium, including but not limited to beryllium in soil and water; however, the 10 Code of Federal Regulations 850, "Chronic Beryllium Disease Prevention Program (CBDPP)" [action level](#) will be applied to personal breathing zone exposure assessments of beryllium regardless of the source, i.e. natural or anthropogenic. In addition, any applicable American Conference of Governmental Industrial Hygienists Threshold Limit Values and/or Occupational Safety and Health Administration Permissible Exposure Limits shall be applied regardless of the source of beryllium.

Existing operational tasks that are within the scope of this CBDPP **are presented on the [Beryllium Information Site](#)**. **These activities do not** meet the definition of a [regulated area](#). While performing the update of the SNL site-wide beryllium inventory, several buildings/areas **were** identified as having [removable contamination](#). These buildings/areas fall under the scope of this CBDPP until they have been decontaminated.

*TRAINING

Requirements

Changes to scope and content of training courses shall require approval by the Beryllium Subject Matter Expert, or designee.

Work Activity or Role	Required	Recommended
 <p>Members of the Workforce identified as beryllium-associated workers, which includes beryllium workers.</p>	<p>BEA100 BEA101 R 10CFR850</p>	<p>N/A</p>

Members of the Workforce who are not necessarily beryllium-associated workers , but who work at a site where beryllium activities are conducted.	BEA100 R 10CFR850	N/A
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*BASELINE INVENTORY

Requirements

Managers shall ensure the following:

- Identification, to the appropriate [Division ES&H Team](#) industrial hygienist, of beryllium [operational areas](#) and other locations of known or potential [beryllium](#) contamination, which have not been previously identified and assessed by an SNL Industrial Hygienist.

Note: New operations shall be evaluated [by the Division ES&H Team industrial hygienist](#) and operations that have been modified should be re-evaluated. New operations are identified through the Integrated Safety Management System (ISMS) Software Primary Hazard Screening (PHS) module and through other processes supporting ISMS.

Contamination assessment using an upper tolerance limit (UTL 95%,95%) calculated from random representative surface wipe samples, as compared to the DOE [equipment and other item](#) release level of 0.2 micrograms beryllium per 100 square centimeters ($\mu\text{g Be}/100 \text{ cm}^2$) for the general public, will be the means for determining whether buildings and areas are contaminated. Using this statistic and this level in such a manner (UTL 95%,95% $< 0.2 \mu\text{g Be}/100 \text{ cm}^2$) Sandia can state we are 95% confident that 95% of the surfaces do not have removable contamination exceeding $0.2 \mu\text{g Be}/100 \text{ cm}^2$. Professional judgment may be used to conclude, based on a review of the data set and using acceptable statistical principles, that the UTL 95%,95% would not exceed $0.2 \mu\text{g Be}/100 \text{ cm}^2$ when an actual UTL can not be calculated. Such situations may include


heavily censored data (greater than 50% of the data points are less than the method detection limit) and/or the data set is not normally or log normally distributed yet the data set suggests removable contamination does not exceed $0.2 \mu\text{g Be}/100 \text{ cm}^2$. Should removable contamination exceed $0.2 \mu\text{g Be}/100 \text{ cm}^2$ for a specific surface randomly sampled, but the (UTL 95%,95%) for the area does not exceed $0.2 \mu\text{g Be}/100 \text{ cm}^2$, the wipe area will be evaluated for possible further action, such as limited decontamination or a determination of whether it is soil accumulation. In addition, judgmental samples may be used to characterize buildings and areas. Such data will also be compared to $0.2 \mu\text{g Be}/100 \text{ cm}^2$.

It has been established that naturally occurring beryllium exists in bulk soil samples for SNL/NM and the surrounding Kirtland Air Force Base range and that the beryllium concentrations are closely correlated to the corresponding aluminum concentration. As a result, samples were collected from visibly dirty surfaces in non-beryllium use areas to establish at what level beryllium could be attributed to soil accumulation. The beryllium-aluminum concentrations from the resulting data set of wipe samples were strongly correlated. Baseline beryllium inventory contamination characterization wipe sample values approaching or exceeding $0.2 \mu\text{g Be}/100 \text{ cm}^2$ are evaluated further by the SNL beryllium program to determine whether the beryllium is a result of beryllium activities or the result of soil accumulation based on beryllium concentrations and the correlation between beryllium and aluminum.

Guidance

Contact the [Division ES&H Team](#) industrial hygienist for aid in determining the potential for beryllium contamination and identification of beryllium operations. Consider the following questions when assessing space for beryllium operational areas and potential contamination:

- Are you currently responsible for any operations that include [abrasive or destructive methods](#) applied to metal objects or stock?
- Are you currently responsible for any operations that use beryllium oxides or beryllium containing ceramics?
- Do you know of any similar activities described above that once existed (no time limit) within facilities you currently control?
- Do you know of any potential activities that once existed (no time limit) within



facilities you currently control that may have resulted in beryllium contamination?

Note: Many commercially available metal products and metal stock contain beryllium; **however**, beryllium may not be identified as a constituent. **As a result**, all activities involving metal that may result in the generation of airborne particles should be **evaluated for beryllium**. This information will be used to identify **Members of the Workforce with potential** exposure to airborne beryllium particulates.


Members of the Workforce exposure may occur while applying abrasive or destructive methods on metal or through activities that could result in beryllium surface contamination becoming airborne. In addition, work with beryllium oxide or beryllium-containing ceramics may result in exposure, if adequate controls are not used.

The intent of the beryllium inventory is to identify **beryllium activities**, **operational areas** and locations of potential **removable contamination**. **Members of the Workforce** exposed or potentially **exposed** to beryllium at those locations will also be identified.

*OPERATIONAL AREAS & BERYLLIUM ACTIVITIES

Requirements

Managers of beryllium **operational areas** and **beryllium activities**, in addition to all other applicable portions of this Section, shall ensure the following prior to the start of work:

- 
- The **Beryllium Contact**, or designee, is notified of the intent to start any new beryllium activities or establishment of any new beryllium operational areas. Such new activities require DOE notification.
 - Careful consideration has been given to minimize the number of Members of the Workforce, and the number of opportunities for the Members of the Workforce, to be exposed to airborne beryllium when planning new work.
 - A site-specific CBDPP Implementation Plan **Technical Work Document** is developed and implemented for these areas and activities that address all of the

applicable requirements and guidance portions of this section. (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements.)

- The TWD is provided to the Beryllium Program Subject Matter Expert to provide to Sandia Site Office (SSO) of DOE when it is **initially** approved or significantly changed subsequent to approval.

NOTE: No task involving potential personnel breathing airborne exposure to airborne beryllium outside the scope of the current beryllium activities presented on the [Beryllium Information Site](#) may be initiated until a CBDPP Implementation Plan is reviewed by SSO.

Guidance

Contact the [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

CONTAMINATED BUILDINGS AND AREAS

Requirements

Managers of buildings or areas within buildings that have been formally identified as being beryllium [contaminated buildings and areas](#) shall ensure the following:

Note: Refer to the flow diagram in Attachment 2 to review the decision logic used by Industrial Hygiene for identifying contaminated building and areas.

- At risk work (work that may result in an exposure) and the release of equipment and other items is stopped until an interim [Technical Work Document](#) is developed and implemented in accordance with all of the applicable requirements and guidance of this section for the short-term management of [removable contamination](#). This includes, but is not limited to worker exposure, training, control of release of equipment and other items, disposal and control of contamination spread (see this section, Technical Work Documents and [Chapter](#)

21, “Technical Work Documents (TWDs)” for additional requirements).

- That long-term management of [contaminated buildings and areas](#) are identified using one of three following options:
 - **Mothballing** the building or area, includes securing access through locks and postings. Area(s) in a building can only be mothballed if they can be completely isolated, i.e., isolated ventilation systems, floor to ceiling walls, lockable doors, etc. A TWD shall be developed that describes and implements actions to control the building.
 - **Decontaminate** the building or area to meet industrial hygiene post decontamination verification requirements. A TWD, that describes decontamination procedures and exposure controls, shall be developed and implemented.
 - **Identify** the building or area as a beryllium [operational area](#) and develop and implement a site-specific TWD, i.e., a Chronic Beryllium Disease Prevention Implementation Plan as specified under the subsection, Beryllium Operational Areas & Beryllium Activities, in this Section.



Note: See this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements.

Guidance

Decontamination is the preferred method for addressing removable surface contamination. Controlling contamination in place should be considered a temporary measure. Controlling contamination in place should be appropriate when funding is being secured to perform decontamination, during decontamination, if work is to continue in the contaminated building or area, or when awaiting support to perform decontamination. Long-term future use of the building should be considered, such as, whether the building is slated for demolition, when deciding how to manage beryllium contamination.

Contact the [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

HAZARD ASSESSMENT

Requirements

Managers shall ensure the following:

- Beryllium [operational areas](#) and other locations/activities of known or potential beryllium contamination or airborne releases are assessed to identify the [Members of the Workforce](#) exposed or potentially exposed to beryllium.
- The appropriate [Division ES&H Team](#) industrial hygienist is contacted to perform beryllium hazard assessments following industrial hygiene program requirements and procedures.

Guidance


Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

EXPOSURE LIMITS, ACTION LEVEL, EXPOSURE REDUCTION AND MINIMIZATION

Requirements

Managers shall ensure the following:

- [Members of the Workforce](#) exposure to beryllium is controlled to ensure that it does not exceed the [OSHA Permissible Exposure Limits \(PELs\)](#) or ACGIH [Threshold Limit Values \(TLVs\)](#), whichever is more stringent.
- Members of the Workforce use appropriate respiratory protection when exposure to beryllium is greater than the Department of Energy [action level](#)

- 
- Controls to reduce and minimize worker exposure to levels below the action level are implemented, if practicable, when worker exposure is above the action level.
 - Actions are implemented to reduce and minimize exposures, if practical, where exposure levels are below the action level.
 - Exposure reduction and minimization actions are implemented using the conventional hierarchy of industrial hygiene controls (i.e., engineering controls, administrative controls, and personal protective equipment, in this order).
 - Provisions for periodic monitoring are implemented when exposure to beryllium is greater than the [action level](#).
 - Provisions described in the, “Warning Signs And Labels” subsection are implemented when exposure to beryllium is greater than the action level.
 - Exposure [control measures](#) are documented and implemented through use of a [TWD](#) (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements). The appropriate [Division ES&H Team](#) industrial hygienist is contacted to perform exposure assessments and provide guidance on exposure reduction and minimization actions as appropriate.



Guidance

Managers should ensure dermal and inhalation exposures are reduced and minimized through the use of control measures. Measurable airborne worker exposure should be avoided by applying the As Low As Reasonably Achievable (ALARA) principle.

“Safe Levels” are not known for everyone working around beryllium. The negative effects of beryllium to health is dependant on at least three factors:

- Concentration of beryllium particles in the inhaled air,
- Length of exposure, and
- Whether an individual has become sensitized to beryllium.

Exposure > Sensitization > Disease

Note: Exposure to beryllium particles through inhalation can cause a serious illness in certain people. This illness, called chronic beryllium disease or CBD, may cause an irreversible and sometimes fatal scarring of the lungs. While CBD is primarily a lung disease, it may also affect other organs, particularly the lymph nodes, skin, spleen, liver, kidneys, and heart. Skin effects (lesions, ulcerations, wart-like bumps) may also develop if beryllium penetrates into cuts or scratches. Beryllium particles must be removed from a wound for proper healing.

REGULATED AREAS AND HYGIENE FACILITIES AND PRACTICES

Requirements

Managers shall establish procedures in a [TWD](#) to address the requirements associated with regulated [areas](#) (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements).

Managers shall ensure the following if airborne concentrations are measured at or above the [action level](#):

Regulated Area:

- A [regulated area](#) is established that is demarcated from the rest of the workplace in a manner to adequately alert [Members of the Workforce](#) to the boundaries of such areas; has access limited to authorized persons; and has a kept record of all individuals who enter. These records must include the name, date, time in and time out, and work activity.

Hygiene Facilities and Practices:

- Food, beverages, and tobacco products are not used nor are cosmetics applied in regulated areas.
- [Members of the Workforce](#) are prevented from exiting regulated areas with contamination on their bodies or their personal clothing.

- Separate facilities free of beryllium contamination are provided where Members of the Workforce change into and store, personal clothing, and clean protective clothing and equipment in order to prevent cross-contamination.
- Change rooms or areas that are used to remove beryllium-contaminated clothing and protective equipment are kept under negative pressure or located so as to minimize dispersion of beryllium from the regulated area into clean work areas.
- Hand washing and shower facilities are provided for Members of the Workforce ([beryllium workers](#)) who work in regulated areas; and that they shower at the end of each work shift.
- Lunchroom facilities are provided that are readily accessible to [beryllium workers](#), and ensure that tables for eating are free of beryllium, and that no **Member of the Workforce** in a lunchroom facility is exposed at anytime to beryllium at or above the action level.
- Beryllium workers do not enter lunchroom facilities wearing or carrying personal protective equipment, unless surface beryllium has been removed from clothing and equipment by HEPA vacuum or other method that removes beryllium without dispersing it.
- Change room areas, shower and hand washing facilities, and lunchroom facilities comply with [29 Code of Federal Regulations 1910.141, "Sanitation"](#).

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

RESPIRATORY PROTECTION

Requirements

Managers shall establish procedures in TWDs to address respiratory protection requirements (see this section, Technical Work Documents and [Chapter 21](#), "Technical

Work Documents (TWDs)” for additional requirements).

Managers shall ensure the following:

- [Respirators](#) are provided and used by all Members of the Workforce who are exposed at or above the [action level](#).
- Respirators are provided and used by all Members of the Workforce who perform tasks for which analyses indicate the potential for exposures at or above the action level.
- Respirators are made available to any beryllium-associated worker who requests to use a respirator for protection against airborne beryllium, regardless of the measured [levels](#).

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements and also refer to [Section 6C](#), “Respiratory Protection.”


PROTECTIVE CLOTHING AND EQUIPMENT

Requirements


Managers shall establish procedures in TWDs to address protective clothing and equipment requirements (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements).

Managers shall ensure that personal protective clothing and equipment is provided to Members of the Workforce and that it is appropriately used and maintained, where dispersible forms of [beryllium](#) may contact skin, enter openings in skin, or contact eyes, including where:


- Exposure monitoring has established that airborne concentrations of beryllium are at or above the [action level](#).

- 
- Surface [removable contamination](#) levels, measured or presumed, prior to initiating work, are above 3 $\mu\text{g Be}/100\text{ cm}^2$.
 - Surface removable contamination level results obtained to confirm housekeeping efforts are above 3 $\mu\text{g Be}/100\text{ cm}^2$.
 - Any beryllium-associated worker requests the use of personal protective clothing and equipment for protection against airborne beryllium, regardless of measured exposure levels.
 - The Division ES&H Team industrial hygienist recommends protective clothing and equipment for [Members of the Workforce](#) in areas shown to have removable contamination above 0.2 $\mu\text{g Be}/100\text{ cm}^2$.


Managers shall establish procedures for donning, doffing, handling, and storing protective clothing and equipment that:

- 
- Prevent beryllium workers from exiting beryllium contaminated areas with contamination on their bodies or their personal clothing. This includes beryllium workers exchanging their personal clothing for full-body protective clothing and footwear before they begin work in [regulated areas](#).

Managers shall ensure the following:

- 
- [Members of the Workforce](#) do not remove beryllium-contaminated protective clothing and equipment from areas that contain beryllium, unless authorized by management through the use of the TWD, to launder, clean, maintain, or dispose of the clothing and equipment.
 - The removal of beryllium from protective clothing and equipment by blowing, shaking, or other means that may disperse beryllium into the air is prohibited.
 - Protective clothing and equipment is cleaned, laundered, repaired, or replaced as needed to maintain effectiveness.
 - Beryllium-contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed in containers that prevent the dispersion of beryllium dust. These containers must be labeled in accordance with the requirements under Warning Signs and Labels in this section.

Organizations that launder or clean beryllium-contaminated protective clothing or equipment are informed in writing that exposure to beryllium is potentially harmful, and prescribe, in writing, the manner in which clothing and equipment should be laundered or cleaned to prevent the release of airborne beryllium.

- 
- Communications, regarding hazards associated with cleaning or laundering protective clothing and equipment and methods to prevent the release of airborne beryllium, are provided to the appropriate [Division ES&H Team](#) industrial hygienist and other essential organizations for review and recommendation for approval prior to communicating to the laundering organization. Such communications shall be contractually implemented when the laundering organization is a contractor.

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.


HOUSEKEEPING



Requirements

Managers shall establish procedures in [TWDs](#) to address housekeeping requirements where [beryllium activities](#) are performed (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements).

Managers shall ensure the following:

- Where beryllium activities are performed, routine surface sampling is conducted by or at the direction of, the [Division ES&H Team](#) industrial hygienist to determine housekeeping conditions.
 - Surfaces contaminated with beryllium dusts and waste do not exceed a [removable contamination](#) level of 3 $\mu\text{g Be}/100\text{ cm}^2$ during non-operational periods. Non-operational periods shall be post shift or at a logical end of an activity involving the release of airborne beryllium particulate, such as the end of a shot at Z-Machine, but not to exceed 24 hours.
- 

- The frequency of routine surface sampling is determined with the appropriate [Division ES&H Team](#) industrial hygienist and documented in the applicable TWD. Sampling need not be performed at the end of every operational period, but at an established frequency that demonstrates the effectiveness of the housekeeping methods employed.
- Removable contamination level is measured post-shift or when non-operational and is not an absolute value of $3 \mu\text{g Be}/100 \text{ cm}^2$ at all times during working with beryllium or beryllium parts, but is intended as a post-shift measure of the effectiveness of routine housekeeping efforts. Removable contamination may exceed $3 \mu\text{g Be}/100 \text{ cm}^2$ when operational.
- Surface sampling for housekeeping need not include the interior of installed closed systems such as enclosures, glove boxes, chambers, or ventilation systems.
- When cleaning floors and surfaces in areas where beryllium is present, beryllium-contaminated floors and surfaces are cleaned using a wet method, [high-efficiency particulate air \(HEPA\)](#) vacuum, or sticky tack cloths, that avoid the production of airborne dust.
- Compressed air or dry methods are not used for such cleaning.
- Portable or mobile vacuum units used to clean beryllium-contaminated areas are equipped with HEPA filters and filters are changed as often as needed to maintain their capture efficiency.
- Cleaning equipment, such as a HEPA vacuum, used to clean beryllium-contaminated surfaces are labeled, controlled, and not used for non-hazardous materials.

Note: Good housekeeping practices are necessary in operational areas where beryllium is used or handled, to prevent the accumulation of beryllium contamination on surfaces throughout the workplace. Such accumulations, if not controlled, may lead to the spread of beryllium contamination on surfaces and the re-suspension of beryllium particles into the air, both in the area where beryllium dusts were originally generated and in other work areas. In addition, the uncontrolled accumulation of beryllium contamination on equipment in the workplace increases the potential for worker exposure to beryllium during the performance of equipment maintenance, handling, and disposal tasks.

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

RELEASE CRITERIA


Requirements

Managers shall ensure the following:

- [TWDs](#) that address the release of [beryllium contaminated](#) equipment and other items are developed and implemented (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements).
- Equipment release procedures and practices are developed to minimize the potential for the inadvertent transport of beryllium contamination to uncontrolled areas (non-beryllium areas).
- A log, database, or other means of tracking items is established for release from [operational areas](#) and [regulated areas](#).
- Procedures, at a minimum, address:
 - Decontamination of equipment and other items; confirmation of decontamination is obtained through wipe surface sampling (performed by/ or at the direction of the [Division ES&H Team](#) industrial hygienist).
 - Labeling of released equipment and other items.
 - Release letter notification and letters of [recipient's commitment](#).
 - Containerization/containment.
 - [Beryllium risk assessments](#).


Note: If equipment or other items are routinely sent to a specific recipient, the written notification and recipient's commitment may be written to encompass the multiple releases over an established period of time as long as the conditions of release remain the same. Should conditions change, the recipient's commitment shall be reestablished.

Releases to Reapplication and Recycle

- 
- Only equipment and other items that meet the criteria for an [uncontrolled release](#) (i.e., not contaminated, do not require labels or a recipient's commitment) may be sent for reapplication or recycling.

Releases to the General Public and Non-Beryllium Areas


Note: For release(s) to a non-beryllium area or the general public see the flow diagram in Attachment 3 to review the logic decision criteria used by the appropriate [Division ES&H Team](#) industrial hygienist.

- 
- Consideration shall be given to the cost of decontamination and the cost of wipe sampling to confirm decontamination, when determining whether release of equipment or other items is the best business practice. Additionally, consideration shall be given to the potential for health risk to Members of the Workforce and the public and negative public relations when releasing equipment to non-beryllium areas or the general public.
 - Beryllium contaminated equipment and other items are cleaned to the lowest concentration level practical, but not to exceed the established release levels prior to releasing to a non-beryllium area or the general public. The equipment shall be decontaminated externally and to the extent feasible internally, so that the removable beryllium surface contamination has been determined to not exceed 0.2 ug Be/100 cm² as established through representative wipe sampling.
 - The equipment or item is labeled in accordance with the “Warning Signs and Labels” subsection below.
 - A release letter is sent and a corresponding written recipient's commitment is received.
 - The Equipment Release Letter template in Attachment 1 is used in its entirety and on Sandia National Laboratories Letterhead.

- Any modifications to this release letter other than those noted in the template must be approved by the Beryllium Program Subject Matter Expert, or designee.
- All correspondence regarding released equipment and other items must be archived by the organization releasing the equipment and made available for review upon request.


Releases from one Operational Area to Another at SNL

An approved site-specific TWD is required prior to release of equipment to another operational area or regulated area within Sandia-controlled premises:

- 
- The equipment or item is labeled and placed in sealed, impermeable bags or containers to prevent the release of beryllium dust during handling and transportation. The bags, container, and enclosures that are used shall also be labeled. If plastic bags are used, the equipment or item shall be doubled bagged. A recipient's commitment, decontamination, and wipe sampling are not required. The TWD for such releases shall define contamination and exposure control measures (see this section, Technical Work Documents and [Chapter 21](#), "Technical Work Documents (TWDs)" for additional requirements.)


Releases to an Operational Area Outside SNL

An approved CBDPP is required prior to release of equipment to operational areas outside of Sandia-controlled premises at other DOE facilities:

- 
- The equipment or item is decontaminated so that the removable contamination levels do not exceed 3 ug/100 cm² as established through representative wipe sampling performed by, or at the direction of, the Division ES&H Team industrial hygienist. The equipment or item is labeled and placed in sealed, impermeable bags or containers to prevent the release of beryllium dust during handling and transportation. The bags, container and enclosures that are used shall be labeled. If plastic bags are used, the equipment or item shall be doubled bagged. A written notification from the receiving DOE facility stating that it is operating under a DOE approved CBDPP shall be obtained prior to releasing the equipment or other items. The notification shall include the site name, address, a point of contact and telephone number, the title of the CBDPP operating under, a statement that it has been approved by the appropriate DOE Field Element, and copies of the

notification shall be provided to the Beryllium Program Subject Matter Expert.

Guidance



Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

Disposal of [beryllium-containing and beryllium-contaminated waste](#) that does not require decontamination or confirmatory wipe sampling, may be an economical and low risk alternative to decontamination and reuse of some items. Refer to the Waste Disposal portion of this section and [Chapter 19](#), "Waste Management."

[Beryllium articles](#) should be labeled or otherwise identified as beryllium containing when they are released to others and may be subjected to destructive or abrasive activities.

It is recommended that the release letter be sent out under the signature of the Manager who authorizes release of the equipment and other items.



DISPOSAL

Requirements


Managers shall establish procedures in TWDs to address disposal requirements (see this section, Technical Work Documents and [Chapter 21](#), "Technical Work Documents (TWDs)" for additional requirements).

Managers shall ensure the following:

- Waste minimization principles are applied to the generation of [beryllium-containing and beryllium-contaminated waste](#).
- Beryllium-containing and beryllium-contaminated wastes are placed in sealed, impermeable bags or containers to prevent the release of beryllium dust during handling and transportation. The bags, container and enclosures that are used for disposal of beryllium waste shall be labeled. If plastic bags are used, the equipment or item shall be double bagged. A recipient's commitment,

decontamination, and wipe sampling are not required. Refer to [Section 19F, "Other Waste"](#) for additional waste disposal requirements.

- Equipment and other items defined as beryllium-contaminated, when contamination has been fixed through methods such as encapsulation and equipment, will not go directly for disposal. That is it will be stored for an extended period of time or it may undergo a downstream process that may disturb fixed beryllium, such as torch cutting into manageable pieces.

- 
- Beryllium-containing equipment and other items, including [beryllium articles](#) (beryllium containing non-sparking tools, excess beryllium alloy metal stock), shall not be reapplied or recycled unless the appropriate [Division ES&H Team](#) industrial hygienist has performed a risk assessment and determined that it may be treated as an uncontrolled release.

Note: The waste requirements in [10CFR850](#) are not applicable to water and soil containing beryllium from either natural or anthropogenic sources. Applicable federal, state and local regulations apply see [Chapter 10](#), "Environmental Protection" for applicable requirements.

BERYLLIUM EMERGENCIES




Requirements

Managers and Members of the Workforce shall ensure that all [beryllium emergencies](#) are reported to the Emergency Operations Center following the requirements of [Chapter 15](#), "Emergency Preparedness and Management."

MEDICAL SURVEILLANCE, REMOVAL, CONSENT AND COUNSELING


Requirements



Managers, Members of the Workforce, and [contractors](#) shall contact the appropriate [Division ES&H Team](#) industrial hygienist and Health, Benefits, and Employee Services regarding recommendations for inclusion and participation, respectively, in the SNL Beryllium Medical Surveillance Program when they are exposed or potentially exposed to airborne beryllium.

Note: The Beryllium Medical Surveillance Program includes, but is not limited to, interviews, physical exams, initial and follow-up periodic evaluations, medical removal from exposure to beryllium, counseling, and medical consent as described in the following documents:

- Medical Surveillance Program ([MEDPG-011](#))
- Beryllium Medical Surveillance Procedure ([OP-MED045](#))
- [Chapter 16](#), “Benefits And Health Services”



Note: Participation, as well as inclusion, in the Beryllium Medical Surveillance program is voluntary. [Beryllium workers](#) are identified by the appropriate [Division ES&H Team](#) industrial hygienist and the Manager for inclusion into the program; however, Members of the Workforce who believe they meet the definition of a [Beryllium-associated worker](#) may self-identify as a participant and request an evaluation.

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist and/or Health Services for technical support in meeting these requirements.



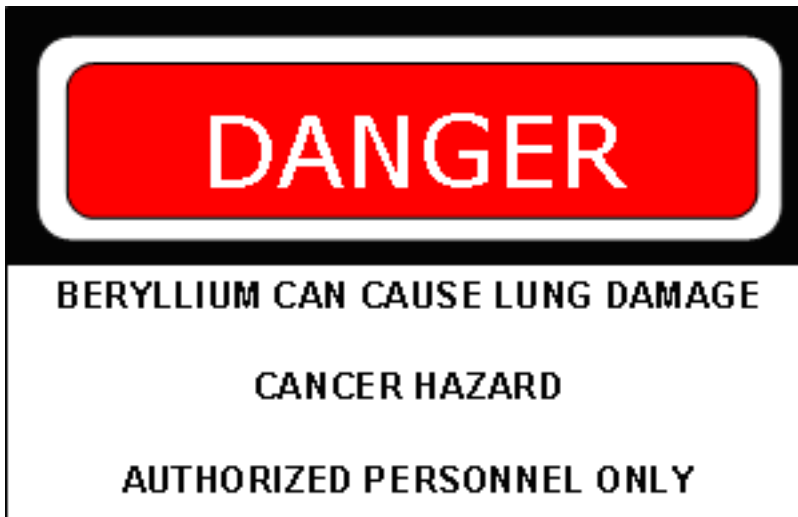
*WARNING SIGNS AND LABELS

Requirements

Managers shall establish procedures in [TWDs](#) to address sign and labeling requirements (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements.)

Managers shall ensure the following:

- Warning signs are posted at each access point to a [regulated area](#) and contain the following information:

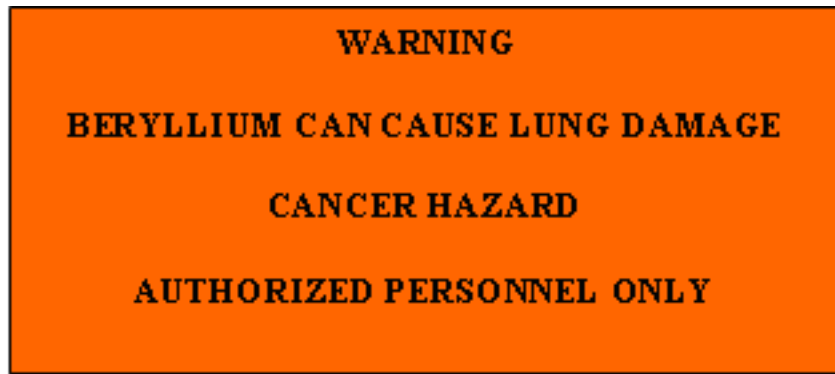


- Warning Labels are affixed to all containers of beryllium, beryllium compounds, or beryllium-contaminated clothing, equipment, waste, scrap, or debris and contain the following information:

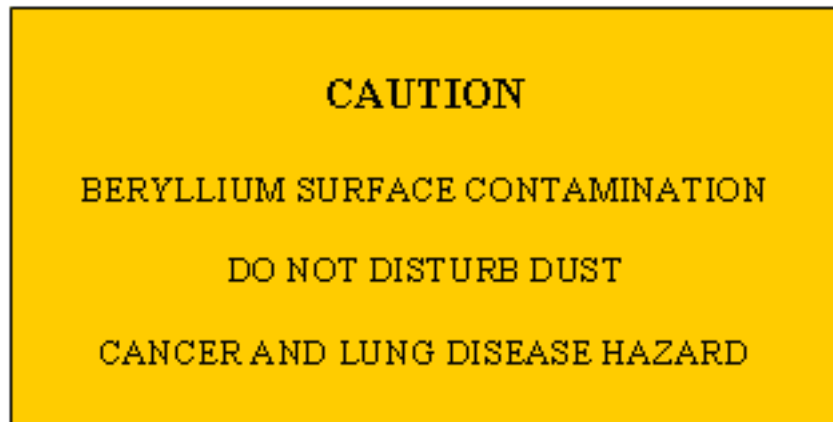


- Warning signs are posted at each access point where [beryllium activities](#) are performed [that are not regulated areas](#) and contain the following information:





- Caution signs are posted at each access point to [contaminated buildings and areas](#) and [operational areas](#) and contain the following information:



- Caution labels are affixed to equipment such as HEPA vacuums used to clean beryllium-contaminated surfaces with the following information, specifying the building where used:

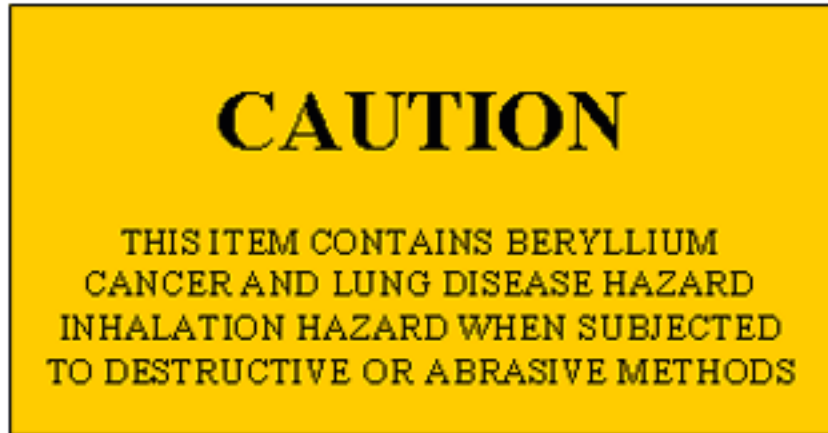


- Signs and tags are consistent with the requirements specified in [Section 4M](#), "Signs (Including SWHAS) and Tags." Danger labels shall be red or predominantly red with lettering in contrasting color such as black. Warning labels shall be orange or predominately orange with lettering in a contrasting color. Caution labels shall be yellow or predominantly yellow with lettering in a contrasting color.

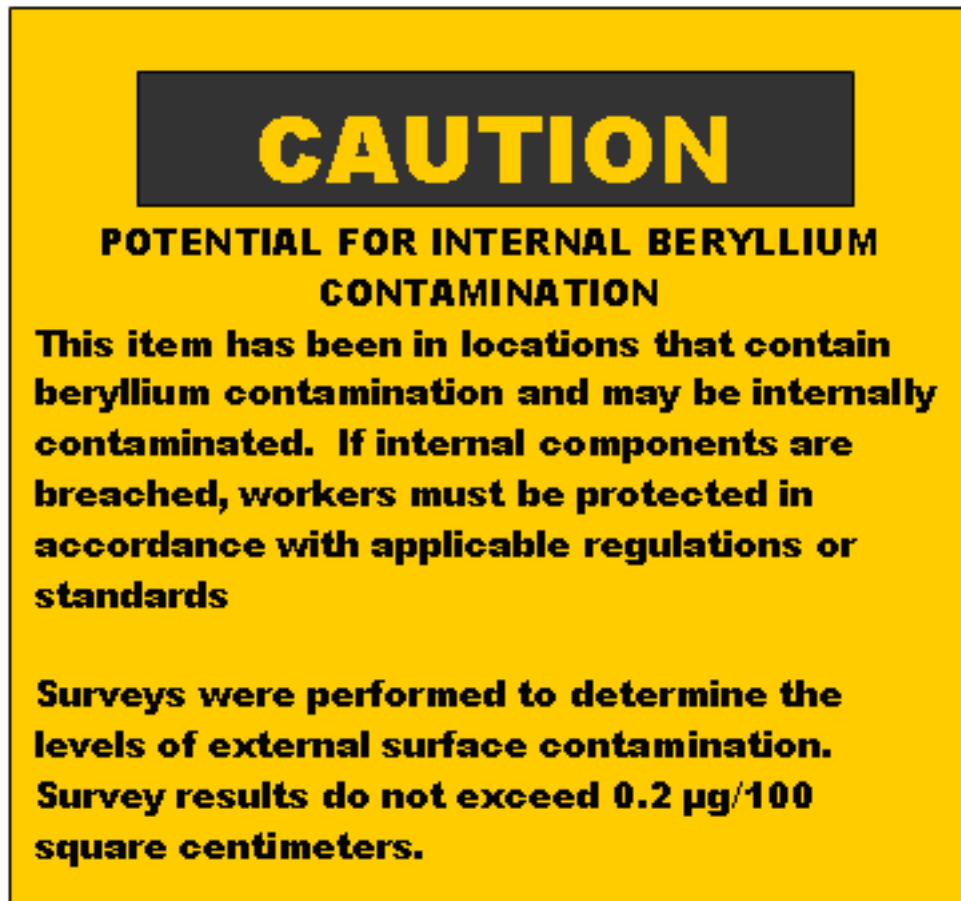
Guidance

Additional labels and signs may be warranted.

[Beryllium articles](#) should be labeled or otherwise identified as beryllium containing when they are released to others and may be subjected to destructive or abrasive activities.



To identify the potential for internal contamination from equipment, the following label should be used **in addition to the required Danger labeling** to alert individuals:



Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

*RECORD KEEPING AND USE OF INFORMATION

Requirements

The Sandia Delegated Representative ([SDR](#)) shall ensure that personal monitoring data collected by contractors on [contractor](#) staff participating in the Sandia Beryllium Medical Surveillance Program is provided to the Beryllium Program Subject Matter Expert semi-annually in December and June for inclusion in the semi-annual registry. **Note:** Personal monitoring data collected by the appropriate [Division ES&H Team](#) industrial hygienist is accessible by the Beryllium Program Subject Matter Expert and need not be submitted to them.

Managers shall ensure records that are generated or maintained to document activities involving beryllium including but not limited to archived TWDs, entrance logs, air or wipe sampling reports, log of items released from operational areas, release notification letters and recipient commitment letters shall be considered records as defined in [Sandia Records Management Manual](#) and will be forwarded to the ES&H Records Center with a copy provided to the SME upon completion of the project, activity, or at such time as they are no longer required for ongoing work.

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

CONTAMINATION CONTROL

Requirements

Managers shall establish procedures in [TWDs](#) to effectively reduce the spread of removable beryllium contamination and airborne releases (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements).

Guidance

Elements of a good contamination control process include, but are not limited, to the following:

- Monitoring/sampling program (e.g., area and equipment exposure monitoring).
- Good housekeeping.
- Confinement of beryllium activities to the smallest possible area.
- Source control.
- Eliminate or control the transport path.
- Record keeping & documentation.
- Corrective actions.
- Personal protective clothing and equipment.
- Personal protective equipment donning and doffing stations.
- Engineering controls (e.g., local exhaust ventilation and step-off pads).
- Administrative controls (i.e., TWDs).

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

DECONTAMINATION

Requirements

Managers shall ensure [TWDs](#) are developed and implemented when Members of the Workforce perform beryllium decontamination in [contaminated buildings and areas](#),

[operational areas](#), or [regulated areas](#) (see this section, Technical Work Documents and [Chapter 21](#), “Technical Work Documents (TWDs)” for additional requirements). The TWD shall include the following elements:

- Decontamination procedures commensurate with the level of contamination.
- Personal protective equipment ([PPE](#)) commensurate with the level of contamination.
- Training commensurate with the level of decontamination to be performed, at a minimum BEA100 “ Beryllium Awareness” and BEA101 for [beryllium workers](#); LAB100 or HAZ101I (HAZ103). Also, any applicable training on PPE.
- Identification of the Members of the Workforce for inclusion in the Beryllium Medical Surveillance Program, when beryllium contamination is significant or there is a potential for exposure during decontamination activities.
- A section that addresses cleaning floors and surfaces using a wet method, [high-efficiency particulate air \(HEPA\)](#) vacuuming or other cleaning methods, such as sticky tack cloths, that avoid the production of airborne dust.)
- A statement that compressed air or dry methods cannot be used.
- A goal for [removable contamination](#) levels not to exceed the baseline inventory upper tolerance limit of 0.2 $\mu\text{g Be}/100 \text{ cm}^2$ for decontamination efforts of buildings and areas (as described in the “Baseline Inventory” subsection above) and 0.2 $\mu\text{g Be}/100 \text{ cm}^2$ for equipment and other items.

Note: With heavily censored data (greater than 50% of the data points are less than the method detection limit) and no more than one sample result above the release criteria of 0.2 $\mu\text{g Be}/100 \text{ cm}^2$ for a specific surface randomly sampled, professional judgment may be used to determine further actions taken.

Note: A Line TWD is not required for beryllium decontamination performed by contractors. Applicable controls and documents shall be established through the contract process.

Note: The appropriate [Division ES&H Team](#) industrial hygienist evaluates the potential for airborne exposure and provides the names of Members of the Workforce who have

been identified for inclusion in the Beryllium Medical Surveillance Program to Health Services.

Guidance

For buildings and areas where removable beryllium contamination does not exceed the 0.2 µg Be/100 cm² level or where beryllium is a component in soil, as determined by the appropriate [Division ES&H Team](#) industrial hygienist, decontamination is not necessary and general housekeeping methods may be performed. There are no requirements for housekeeping procedures in these areas.

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

*TECHNICAL WORK DOCUMENTS

Requirements

Managers shall ensure that [TWDs](#) are developed and implemented prior to the start of work activities or operations identified in this section and that they meeting the following requirements:

- TWDs developed to direct work must have the specificity and detail so that [Members of the Workforce](#) can understand and implement the TWD.
- TWDs are developed with the technical support of the [Division ES&H Team](#) industrial hygienist.
- TWDs identify the hazards and [control measures](#) to be used to mitigate those hazards.
- TWDs are developed in accordance with [Chapter 21](#), “Technical Work Documents (TWDs).”
- When multiple TWDs are developed for an area or activity, they will be integrated to avoid redundancies and conflicting requirements.

- 
- TWDs are submitted to the [Division ES&H Team](#) industrial hygienist for formal review and recommendation for approval.
 - The responsible ES&H Coordinator and [Division ES&H Team](#) industrial hygienist shall review and sign the TWD prior to submittal to the Beryllium Subject Matter Expert.
 - TWDs are approved by the appropriate Manager.
 - TWDs are submitted to the Beryllium Program Subject Matter Expert, or designee for review and approval.
 - TWDs contain a worker sign off sheet on which they acknowledge having read and understand the procedure. Members of the Workforce who perform work under the scope of a TWD, sign the acknowledgement sheet. The acknowledgement sheet includes the following statement and is maintained by the author and made available upon request:
 - By signing below, I affirm that I have read and understand this TWD and all the references called out in procedural and informational steps. I agree to operate within the stated constraints.
 - The [Division ES&H Team](#) industrial hygienist participates in any re-write or update to a TWD.
 - An update of the TWD is provided to Beryllium Program Subject Matter Expert, or designee for review whenever a significant change or significant addition to the TWD is made.
 - A Chronic Beryllium Disease Prevention Program Implementation Plan (CBDPP IP) is a TWD required for all beryllium activities. The CBDPP IP must specify how the user will comply will all aspects of the corporate CBDPP. In addition to review by the Division ES&H Team IH, the IP requires review and approval by the Beryllium Subject Matter Expert. A copy of the approved IP will be provided to Sandia Site Office.
- 

Guidance

Contact the appropriate [Division ES&H Team](#) industrial hygienist for technical support in meeting these requirements.

PERFORMANCE FEEDBACK

Requirements

Managers shall ensure the following:

- [Self-assessments](#) are performed every two years that address the implementation of the requirements of this section for beryllium [operational areas](#) and [regulated areas](#).
- Self-assessment documentation is provided to the appropriate [Division ES&H Team](#) industrial hygienist and the Beryllium Program Subject Matter Expert as soon as possible, after the completion of the self-assessment.
- Continuous participation in beryllium program assessments to make information available for maintenance and improvement of all elements in this section, Chronic Beryllium Disease Prevention Program.
- Written feedback, as appropriate, is provided to the Beryllium Program Subject Matter Expert regarding mechanisms for improvement to this Section for meeting the intended purpose of 10 Code of Federal Regulation [Part 850](#), "Chronic Beryllium Disease Prevention Program." Written feedback on the following:
 - Reduction in the number of current [Members of the Workforce](#) who are exposed to beryllium by clearly identifying and limiting worker access to areas and operations that contain or utilize beryllium.
 - Minimization of the potential for, and levels of, worker exposure to beryllium by implementing engineering and work practice controls that prevent the release of beryllium into the workplace atmosphere and/or capture and contain airborne beryllium particles before worker inhalation.
 - Establishment of medical surveillance to monitor the health of exposed

Members of the Workforce and ensure early detection that makes possible early treatment of disease.

- Establishment of continual monitoring for program effectiveness in preventing chronic beryllium disease and implementing program enhancements as appropriate.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [beryllium](#) include:

Hazard/Activity	Reference
Potential inhalation or dermal exposure to beryllium.	Section 4L , “Personal Protective Equipment (PPE)” Section 6C , “Respiratory Protection”
Generation of beryllium-containing waste or beryllium-contaminated equipment or other items to be disposed of as waste.	Section 19F , “Other Waste”
Participation in the Beryllium Medical Surveillance Program	Chapter 16 , “Benefits and Health Services”
Work with hazardous chemicals (i.e., beryllium)	Section 6D , “Hazard Communication Standard” Section 6E “Laboratory Standard - Chemical Hygiene Plan”
Beryllium Emergencies	Chapter 15 “Emergency Preparedness and Management”

REFERENCES

Requirements Source Documents

[10 CFR 850](#), *Chronic Beryllium Disease Prevention Program*.

[29 CFR 1910.134](#), *Respiratory Protection*.

[29 CFR 1910.141](#), *Sanitation*.

[29 CFR 1910.1200](#), *Hazard Communication*.

[29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[29 CFR 1910.145](#), *Specifications for Accident Prevention Signs and Tags*.

Implementing Documents

[OP-MED045](#), *Beryllium Medical Surveillance Procedure*.

Industrial Hygiene Beryllium Program Document, Rev 2004.

PG470218, *Worker Protection Program (WPP)*.

Related Documents

Implementation Guide for use with [10 CFR Part 850](#), *Chronic Beryllium Disease Prevention Program*.

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ES&H Manual

SECTION 12C – COMMERCIAL MOTOR VEHICLES (CMVs) AND COMMERCIAL DRIVER'S LICENSES (CDLs)

Subject Matter Expert: [Elizabeth Carson](#) (all sites)

MN471001, Issue B

Revision Date: [January 5, 2007](#); Replaces Document Dated: May 5, 2005

Review Date: November 6, 2006



* Indicates a substantive change

- [Applicability](#)
 - [*Training and Certification](#)
 - [*Federal Motor Carrier Safety Regulations](#)
 - [*Commercial Vehicles and Drivers](#)
 - [Responding to Packaging and Transportation Emergencies](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY



For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who:

- Transport [placarded quantities of hazardous materials onsite](#) or [offsite](#).
- Operate a [commercial motor vehicle \(CMV\)](#), regardless of the cargo, onsite between technical areas, or offsite.
- Operate a [commercial motor vehicle \(CMV\)](#), on the interstate (across state lines), with a gross vehicle weight rating (GVWR) of greater than 10,001 lbs.
- Supervise any of the above activities or employees.

Note: For questions about the requirements of this section, consult the [Federal Motor Carrier Safety Regulations \(FMCSR\) Program Administrator](#).

Note: In addition to various contacts cited throughout this section (e.g., for consultation regarding requirements), attachments 12A-1 through 12A-6 provide additional resources of information on a variety of relevant topics at specific sites where Sandia work is performed.

Site-Specific Applicability

[Table 1](#), “Applicability at Remote Sites,” provides site-specific information about the applicability of the requirements in this section at remote sites.

Table 1. Applicability at Remote Sites

Remote Site	Site-Specific Applicability ¹
Sandia-controlled premises other than SNL/NM or SNL/CA (e.g., the Tonopah Test range [TTR] and the Kauai Test Facility [KTF]).	Sandia requirements and practices apply, but are revised as necessary to comply with applicable state and local laws. For additional information see the list of site-specific contacts in attachments 12A-1 through 12A-6.
Non-Sandia-controlled premises (e.g., the Nevada Test Site [NTS], Yucca Mountain Facility, Pantex, DoD Facilities, etc.).	The requirements and practices of the host facility apply.

¹ Deviations from host procedures require the documented consensus of the host and the resident Sandia manager.

Exceptions to Applicability

[Table 2](#), “Exceptions to the CDL Requirements for Onsite Transport of Placarded Quantities of Hazardous Material,” identifies exceptions to the requirement for a [commercial driver's license \(CDL\)](#) for transport of certain hazardous materials [onsite](#).

Table 2. Exceptions to the CDL Requirements for Onsite Transport of [Placarded Quantities of Hazardous Material](#)

Exception	Explanation
Emergency-response-related and security-related items and material when transported by an employee whose primary work responsibilities include physical security or emergency response.	This section does not apply to hazardous material, or any item containing hazardous material , that is routinely transported onsite for the purpose of emergency response or physical security at Sandia. These items and materials include, but are not limited to, fire extinguishers, breathing air cylinders, ammunition, and recovered spill residue.
Hazardous items required for facility maintenance or custodial services.	These items are excluded from the requirements of this section and include properly labeled welding gas cylinders, lecture bottles containing compressed gases for instrument calibration purposes, paint, and janitorial supplies.
Subcontracted services.	The suppliers of subcontracted services (e.g. construction services, the delivery and pickup of gas cylinders, etc.) are excluded from the requirements of this section unless specifically stated otherwise in an agreement (contract) between Sandia and the supplier.

*TRAINING AND CERTIFICATION

*Requirements

Managers shall be responsible for ensuring that all drivers who are subject to the requirements of this section comply with the training and certification requirements in [Table 3](#), "Training and Certification Requirements," prior to operating a vehicle [offsite](#), or within 90 days of operating a vehicle [onsite](#).

Managers and supervisors of drivers who are required to possess a [commercial driver's license \(CDL\)](#) shall receive, at a minimum:

- PKX160, Introduction to the Federal Motor Carrier Safety Regulations.
- Drug and Alcohol Awareness Training.

Table 3. Training and Certification Requirements

Work Activity or Role ¹	Required Training	Required Certification ^{2, 3, 4}
Drivers of CMVs, onsite between technical areas.	PKX 150, PKX 160, and Drug and Alcohol Awareness Training. Driver Skills Refresher Training every 24 months after issuance of CDL.	CDL . Class of license is determined by vehicle weight/configuration with appropriate endorsements, if any.
Drivers of CMVs offsite .	PKX 150, PKX 160, and Drug and Alcohol Awareness Training. Driver Skills Refresher Training every 24 months after issuance of CDL.	CDL. Class of license is determined by vehicle weight/configuration with appropriate endorsements, if any.

Interstate drivers (across state lines) of vehicles with GVWR greater than 10,001 lbs. but less than 26,001 lbs.	PKX 150, PKX 160.	Valid driver's license ⁵ and a current medical certificate.
Managers and supervisors of drivers who are required to have a CDL.	PKX 160 and Drug and Alcohol Awareness Training.	N/A

¹ Additional regulations apply for intrastate drivers of certain vehicle configurations (wholly within a single state's boundaries). Contact the [FMCSR Program Administrator](#) for details.

² A CDL requires satisfactory completion of a physical examination, a road test, and a written test, and enrollment in the Sandia Health Services Drug and Alcohol Program, which includes random drug and alcohol testing in accordance with Department of Transportation regulations.

³ A HAZMAT endorsement is also required for transport of [placarded quantities of hazardous materials](#).

⁴ A **passenger** endorsement is also required for operating a vehicle used to transport more than 15 passengers (16 including the driver).

⁵ A driver who is **not** transporting more than 15 passengers (16 including the driver) or placarded quantities of [hazardous material](#) requires only a valid driver's license. Enrollment in the Sandia FMCSR Program is also required.

*FEDERAL MOTOR CARRIER SAFETY REGULATIONS

*Requirements

Managers and supervisors of Members of the Workforce who are required to be enrolled in the Sandia Federal Motor Carrier Safety Regulation (FMCSR) Program, shall:

- Be familiar with FMCSR (see CPR400.1.1.17/[GN470084](#), *Complying with Federal Motor Carrier Safety Regulations*, and [49 CFR, Chapter III](#), *Federal Motor Carrier Safety Administration, Department of Transportation*).
- Ensure that Members of the Workforce enroll in the FMCSR Program, as appropriate.

Members of the Workforce shall:

- Enroll in the Sandia FMCSR Program if they:
 - Operate a vehicle interstate (across state lines) with a GVWR in excess of 10,001 lbs.
 - Operate a [CMV](#), defined at Sandia as any vehicle:
 - With a GVWR of 26,001 lbs or more, operated [onsite](#) between technical areas.
 - With a GVWR of 26,001 lbs or more, operated [offsite](#) within state boundaries (intrastate).
 - Used to transport more than 15 passengers (16 including the driver), onsite or offsite.
 - Used to transport [placarded quantities of hazardous materials](#), regardless of the weight of the vehicle.

Note: For criteria for the onsite transportation of placarded hazardous material, see Section 12A, "Onsite Packaging and Transportation (P&T) of Hazardous Material," [Table 5](#), "Additional Requirements for Onsite Transportation of Non-Radioactive Hazardous Waste." For all other transport of placarded hazardous material, consult the [packaging and transportation contact](#).

- Complete applicable training.

- Ensure compliance with all applicable FMCSR before operating a CMV offsite, by referring to the [FMCSR Compliance Manual and Drug and Alcohol Policy Statement](#) or contacting the [FMCSR Program Administrator](#).

Members of the Workforce who operate commercial vehicles onsite/offsite shall:

- Complete a DVIR on each vehicle driven and the report shall cover, at a minimum, the following parts and accessories:

- Service brakes including trailer brake connections
- Parking (hand) brake
- Steering mechanism
- Lighting devices and reflectors
- Tires
- Horn
- Windshield wipers
- Rear vision mirrors
- Coupling devices
- Wheels and rims
- Emergency equipment (fire extinguisher, safety triangles)

The DVIR report shall identify the vehicle and list any defect or deficiency discovered by or reported to the driver which would affect the safety of operation of the vehicle or result in mechanical breakdown.

Note: If no defect or deficiency is covered by or reported to the driver, the report shall so indicate.

- In all instances, the driver shall sign the report.

- On two-driver operations, only one driver needs to sign the driver vehicle inspection report, provided both drivers agree regarding the defects or deficiencies identified.
- If a driver operates more than one vehicle during the day, a report shall be prepared for each vehicle operated.

Prior to requiring or permitting a driver to operate a vehicle, every motor carrier or its agent shall repair any defect or deficiency listed on the previous driver vehicle inspection report which would be likely to affect the safety of operation of the vehicle.



- The mechanic then signs off certifying on the original driver vehicle inspection report that the defect or deficiency has been repaired or that repair is unnecessary before the vehicle is operated again.
- All original DVIRs are maintained by Fleet Services for 3 months from the date the written report was prepared.

Note: The DVIR is subject to audit and shall be returned at the end of each work day to the responsible individual.

*COMMERCIAL VEHICLES AND DRIVERS



*Requirements

The FMCSR Program owner shall ensure that Members of the Workforce who operate commercial vehicles either onsite or offsite shall:

- Maintain a Driver Vehicle Inspection Report (DVIR) book in all SNL commercial vehicles.
- Complete the Driver Vehicle Inspection Report (DVIR) in the driver's own handwriting, in ink and legibly.
- ***Not drive the vehicle if there is an immediate safety defect in the brakes,***

lights, steering, tires, coupling, heating or ventilation.



- **Make arrangements with Fleet Services Department for immediate repair.**
- The SNL Fleet Services mechanic, GSA mechanic, or approved vendor contracted to repair the vehicle shall sign the DVIR where the defect was noted, before the driver may (again) drive the vehicle.
- Submit the original DVIRs to the appropriate POC for review and action, if necessary. The POC shall send the DVIRs to Fleet Services on a weekly basis for audit and recordkeeping.
- Submit, every ninety days, the entire DVIR book to Fleet Services Department for audit and recordkeeping in accordance with the Department of Transportation. At that time, a new book shall be issued to the driver for the specific unit.

Members of the Workforce who operate commercial vehicles shall comply with the additional requirements, as appropriate, that are specified in [Table 4](#), “Additional Requirements for Drivers of CMVs Onsite”; [Table 5](#), “Additional Requirements for Drivers of CMVs Offsite”; and [Table 6](#), “Additional Requirements for Drivers of Non-CMV with GVWR greater than 10,001 lbs, but less than 26,001 lbs, and Operated Interstate (Across State Lines).”

Table 4. Additional Requirements for Drivers of CMVs Onsite

Category	Requirements
<ul style="list-style-type: none"> ● GVWR of 26,001 lbs or more driven between technical areas. ● A vehicle used to transport placarded quantities of hazardous materials.¹ ● A vehicle used to transport more than 15 passengers (16 including the driver). 	<ul style="list-style-type: none"> ● CDL class of license is determined by vehicle weight/configuration with appropriate endorsements, if any. ● Complete a driver vehicle inspection report daily on each vehicle operated. ● Annual Vehicle Inspection that meets DOT standards.



- Current medical certificate.

¹ Placarding requirements are identified in [Table 6](#), “Additional Requirements for Onsite Transport of Radioactive Material,” in Section 12A, “Onsite Packaging and Transportation (P&T) of [Hazardous Material](#).”

Table 5. Additional Requirements for Drivers of CMVs Offsite

Category	Requirements
<ul style="list-style-type: none"> • GVWR of 26,001 lbs or more • A vehicle used to transport placarded quantities of hazardous materials.¹ • A vehicle used to transport more than 15 passengers (16 including the driver). 	<ul style="list-style-type: none"> • Valid and current CDL with appropriate endorsements, if any; class of license is determined by vehicle weight/configuration. • Documented Annual Vehicle Inspection report in the vehicle. • A visual pre-trip inspection conducted before driving the vehicle offsite. • A post-trip Driver’s Vehicle Inspection Report, which shall be completed and turned in to the administrator with the appropriate log at completion of the trip. • Completed Driver Log or Driver Exemption Log. • Current medical certificate.

¹ Placarded quantities are determined by 49 CFR, Transportation, Chapter I, *Research and Special Programs Administration, Department of Transportation, Subpart F*, “Placarding.” Consult the [packaging and transportation contact](#) for assistance.

Table 6. Additional Requirements for Drivers of Non-CMV's with GVWR greater than 10,001 lbs, but less than 26,001 lbs, and Operated Interstate (Across State Lines)

Category	Requirements
<ul style="list-style-type: none"> GVWR of 10,001 lbs., but less than 26,001 lbs., operated interstate (across state lines). 	<ul style="list-style-type: none"> Valid and current driver's license. Documented Annual Vehicle Inspection report in the vehicle. A Driver's Vehicle Inspection Report completed prior to driving the vehicle offsite. Completed Driver Log or Exemption Log.

Guidance

Members of the Workforce should consult the [FMCSR Compliance Manual and Drug and Alcohol Policy Statement](#) for examples of driver logs, vehicle inspection reports, and other pertinent information. This manual also contains a summary of the FMCSR requirements.

If unable to comply with any of the requirements for operating a [CMV onsite](#), Members of the Workforce may contact the [Federal Motor Carrier Safety Regulations \(FMCSR\) Program Administrator](#) to determine if a service is available to perform the work, or if a documented alternative process may be used.

RESPONDING TO PACKAGING AND TRANSPORTATION EMERGENCIES

Requirements

Members of the Workforce who are involved in transportation or handling incidents that involve [hazardous material](#) shall perform the following actions (referred to as the GIN principle), in the order specified:

1. **Get** away from the material.
2. **Isolate** the area and deny entry.
3. **Notify** [emergency response personnel](#) of the type and quantity of the material.




Note: When unsure whether an emergency exists, assume that one does and call the appropriate [emergency phone number](#) in Chapter 15, “Emergency Preparedness and Management.”

Members of the Workforce shall follow the requirements of [Section 18C](#), “Occurrence Reporting,” when reporting a hazardous-material release.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to packaging and transportation of [hazardous material](#) include:

Hazard/Activity	Reference
Accountable nuclear material transportation	<p>CPR400.3.14, <i>Management of Accountable Nuclear Material</i>.</p> <p>SNL/NM-MC&A 97-0900, <i>Nuclear Material Custodian Procedures Manual</i> (applies to all sites except SNL/CA).</p> <p>SAND 83-8036C, <i>Nuclear Material Operations Manual</i> (applies only to SNL/CA).</p>

Biological agents	Section 6N , "Biological Agents and Biosafety."
Emergencies	Chapter 15 , "Emergency Preparedness and Management."
ES&H Events	Chapter 18 , "Reporting, Investigating, and Correcting ES&H Events."
 Explosive material	<p>DOE M 440.1-1, <i>DOE Explosives Safety Manual</i>.</p> <p>Chapter 9, "Explosives Safety."</p> <p>Kirtland Air Force Base regulations (Consult the appropriate Division ES&H Team for assistance).</p> <p>Department of Defense requirements (Consult the appropriate Division ES&H Team for assistance).</p>
 Federal motor carrier safety regulations	<p>FMCSR Compliance Manual and Drug and Alcohol Policy Statement .</p> <p>CPR400.1.1.17/GN470084, <i>Complying With Federal Motor Carrier Safety Regulations</i>.</p>
 Nuclear criticality safety	CPR400.1.1.11/ GN470072 , <i>Nuclear Criticality Safety</i> .
Onsite transportation of classified hazardous material	<p>SNL/NM-CMPC-96-7442-01, <i>Classified Material Control Procedures Manual</i> (applies to all sites except SNL/CA).</p> <p>CPR400.3.12, <i>Management of Classified Matter</i>.</p> <p><i>Classified Procedures Manual</i> (applies only to SNL/CA).</p>



[Radioactive material](#)

CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.

[Technical work documents \(TWDs\)](#)

[Chapter 21](#), “Technical Work Documents (TWDs).”

REFERENCES

Requirements Source Documents

49 CFR, *Transportation*, Chapter I, *Research and Special Programs Administration*, Department of Transportation, [Subpart F](#), “Placarding.”



[49 CFR, Chapter III](#), *Federal Motor Carrier Safety Administration*, Department of Transportation.

[49 CFR 40](#), *Procedures for Transportation Workplace Drug and Alcohol Testing Programs*.

[49 CFR 171](#), *General Information, Regulations, and Definitions*:

[49 CFR 171.15](#), *Immediate Notice of Certain Hazardous Materials Incidents*.

[49 CFR 171.16](#), *Detailed Hazardous Materials Incident Reports*.

[49 CFR 172](#), *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements*.



[49 CFR 383](#), *Commercial Driver's License Standards; Requirements and Penalties*.

[DOE O 460.1B](#), *Packaging and Transportation Safety*

Implementing Documents

SNL, CPR400.1.1.17/[GN47084.htm](#), *Complying With Federal Motor Carrier Safety Regulations*.

SNL, CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.

SNL, CPR400.1.1.31/[MN471011](#), *Explosives Safety Manual*.

SNL/CA, SAND 83-8036C, *Nuclear Material Operations Manual*.

SNL/NM-CMPC-96-7442-01, *Classified Material Control Procedures Manual*.

SNL/NM-MC&A 97-0900, *Nuclear Material Custodian Procedures Manual*.

SNL Drug and Alcohol Policy Statement.

Related Documents

[49 CFR 172.704](#), *Training Requirements*.

[49 CFR 173](#), *Shippers—General Requirements for Shipments and Packagings*.

[49 CFR 177.848](#), *Segregation of Hazardous Materials*.

[Biosafety in Microbiological and Biomedical Laboratories \(BMBL\)](#).

[DOE N 441.1](#), *Radiological Protection for DOE Activities*.

[DOE O 460.1B](#), *Packaging and Transportation Safety*.

[DOE O 460.2](#), *Departmental Materials Transportation and Packaging Management*.

[DOE O 461.1](#), *Packaging and Transfer or Transportation of Materials of National Security Interest*.

[P&T-001](#), *Hazardous Material Packaging & Transportation Program Manual*.



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Sandia National Laboratories

ENVIRONMENT, Safety & HEALTH

Manual

Index of Hazards



Note: This document will be updated on a quarterly basis.

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Hazard/Activity	Chapter/Section/Document Number - Title
A	
Air discharge	Section 18E - Environmental Release Reporting
Air emissions	Section 17B - Air Permits in Bernalillo County, New Mexico
	Section 17C - Air Emissions Control Measures
	Section 17D - Ozone Depleting Substances (ODSs)
	Section 17E - Radionuclide National Emissions Standards for Hazardous Air Pollutants (NESHAP)
Air Quality	Section 6R - Indoor Air Quality
Aircraft	Section 4U - Aviation Safety
Americans With Disabilities Act (ADA) issues	Disabilities Awareness Committee Home Page
Asbestos	Section 6B - Asbestos
	Chapter 16 - Benefits and Health Services
Asphyxiating environments	Section 4W - Asphyxiating Environments

B

 Batteries	Section 4B - Electrical Safety Practices Section 4P - Housekeeping Section 19A - Hazardous Waste Management
Beryllium	Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER) Chapter 16 - Benefits and Health Services
Bicycles	Section 4K - Traffic Safety Chapter 5 - Fire Protection
<u>Biological agents</u>	Section 6N - Biological Agents and Biosafety
<u>Bloodborne pathogens</u>	Chapter 16 - Benefits and Health Services GN470086 - SNL Bloodborne Pathogens Exposure Control Plan
 Burning	Section 4E - Hot Work Safety Section 17B - Air Permits in Bernalillo County, New Mexico MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3
Burns	Section 4E - Hot Work Safety Section 4L - Personal Protective Equipment (PPE) GN470100 - Safe Handling of Cryogenic Fluids

C

Cable tray	Section 4B - Electrical Safety Practices MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements
 Cadmium	Chapter 16 - Benefits and Health Services Section 19A - Hazardous Waste Management

 <p>Capacitor</p>	<p>GN470037 - Lockout/Tagout Procedure for the Control of Hazardous Energy - Attachment D - Lockout/Tagout Procedure Development Guide</p> <p>MN471004 - Electrical Safety Manual</p> <p>Chapter 2 - General Requirements</p> <p>Chapter 4 - Research and Development-Specific Requirements</p> <p>Chapter 5 - Special Occupancies</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1</p>
<p>Carcinogen</p>	<p>Section 6D - Attachment 6D-1 - Manufacture, Distribution, and Import of Hazardous Chemicals</p> <p>GN470094 - Handling Chemicals at SNL/CA</p>
<p>Cart, gas/ electric</p>	<p>Section 4S - Use of Powered Carts</p>
 <p>Carts</p>	<p>Section 4S - Use of Powered Carts</p> <p>Attachment 4S-2 - Charging Batteries in Electric-Powered Carts</p> <p>Attachment 4S-3 - Refueling Gasoline Powered Carts</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3</p>
<p>Chemical Hygiene Plan</p>	<p>Section 6E - Laboratory Standard - Chemical Hygiene Plan</p>
 <p>Chemicals, (substances as identified in 40 CFR, Subchapter R, Toxic Substances Control Act (TSCA)</p>	<p>Section 6S - Toxic Substances Control Act (TSCA)</p>

Chemicals, corrosive	<p>Section 6D - Hazard Communication Standard</p> <p>Section 6E - Laboratory Standard - Chemical Hygiene Plan</p> <p>Section 19A - Attachment 19A-3 - Examples of Potentially Incompatible Waste</p> <p>GN470075 - Guidelines for Waste Generators at SNL/CA</p> <p>GN470094 - Handling Chemicals at SNL/CA</p>
<u>Chemicals, hazardous</u>	<p>Section 4L - Personal Protective Equipment (PPE)</p> <p>Section 6C - Respiratory Protection</p> <p>Section 6D - Hazard Communication Standard</p> <p>Section 6E - Laboratory Standard - Chemical Hygiene Plan</p> <p>Section 6P - Local Exhaust Ventilation (LEV)</p> <p>GN470094 - Handling Chemicals at SNL/CA</p>
<u>Chemicals, import and export</u>	<p>40 CFR, Subchapter R, Toxic Substances Control Act.</p>
<u>Chemical information system (CIS)</u>	<p>Section 6U - Hazardous Material (Chemical and Biological) Inventory</p>
<u>Chemical barcoding and inventory</u>	<p>Section 6U - Hazardous Material (Chemical and Biological) Inventory</p>
Chips	<p>Section 4N - Industrial Machine and Portable Power Tool Safety</p> <p>GN470075 - Guidelines for Waste Generators at SNL/CA</p>





Compatibility[Section 19A](#) - Hazardous Waste ManagementMN471000 - Pressure Safety Manual - [Appendix D](#) - Vacuum Safety

MN471011 - Sandia Explosives Safety Manual


Chapter II - Operational Safety - [Part 3](#)[Chapter VIII](#) - Formulation Scaleup**Compressed****gases**[Section 6D](#) - Hazard Communication Standard

MN471000 - Pressure Safety Manual

[Chapter 5](#)- Selecting and Assembling Pressure Hardware[Appendix I](#) - Pressure System Failures[GN470094](#) - Handling Chemicals at SNL/CA[GN470075](#) - Guidelines for Waste Generators at SNL/CA**Confined space**
entry[Section 6I](#) - Confined Space EntryMN471004 - Electrical Safety Manual - [Chapter 5](#) - Special Occupancies**Construction**
and
construction-
like activitiesSection 1D - [Attachment 1D-4](#) - Management Responsibilities for Minors[Section 4F](#) - Ladders, Scaffolds, and Elevating Work Platforms[Section 4H](#) - Excavations, Trenches, and Floor or Wall Penetrations[Section 4P](#) - Housekeeping[Section 4V](#) - ES&H for Contracted Construction and Construction-Like Activities[Section 10B](#) - National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties[Section 17B](#) - Air Permits in Bernalillo County, New Mexico[Section 17E](#) - Radionuclide National Emissions Standards for Hazardous. Air Pollutants (NESHAP)




	<p>GN470089 - Startup and Restart Process for SNL Moderate- and High-hazard Nonnuclear, Accelerator, and Nuclear Activities</p> <p>MN471016 - Radiological Protection Procedures Manual, Introduction</p>
<u>Cranes</u>	Section 4J - Material Handling - Cranes, Hoists, and Forklifts
<u>Criticality, nuclear</u>	<p>GN470072 - Nuclear Criticality Safety</p> <p>GN470089 - Startup and Restart Process for SNL Moderate- and High-hazard Nonnuclear, Accelerator, and Nuclear Activities</p>
	<p>Section 4L - Personal Protective Equipment (PPE)</p> <p>GN470100 - Safe Handling of Cryogenic Fluids</p> <p>MN471000 - Pressure Safety Manual</p> <p>Chapter 2 - The Pressure Safety Program</p> <p>Chapter 4 - Procuring Pressure Vessels and Special System Components</p>

D

Degreaser	Section 17B - Air Permits in Bernalillo County, New Mexico
<u>Discharge onto ground</u>	Section 10T - Surface and Storm Water Discharges
Disposal of hazardous material	<p>Chapter 10 - Environmental Protection</p> <p>Section 19A - Hazardous Waste Management</p>
Dosimetry	MN471016 - Radiological Protection Procedures Manual - Chapter 4 - Radiation Dosimetry
	<p>Section 4L - Attachment 4L-1 - Eye and Face Protection Recommendations</p> <p>Section 4N - Industrial Machine and Portable Power Tool Safety</p> <p>MN471004 - Electrical Safety Manual - Chapter 5 - Special Occupancies</p>
Dust, explosive	MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1 , Part 2 , Part 3
Dust generation	See Flammable dust or particulate

E

Eating and Drinking	Section 6L - Eating and Drinking
Egress	Chapter 5 - Fire Protection MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1
Electric arc	MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements
Electric, static and magnetic fields	Section 6J - Nonionizing Radiation MN471004 - Electrical Safety Manual - Chapter 5 - Special Occupancies MN471011 - Sandia Explosives Safety Manual Chapter II - Operational Safety - Part 1 , Part 3 Chapter IV - Personal Protective Clothing & Equipment Appendix G - Storage Review Matrices
Electrical, greater than 50 volts and potential for exposure.	Section 4B - Electrical Safety Practices MN471004 - Electrical Safety Manual Chapter 2 - General Requirements Chapter 4 - Research and Development-Specific Requirements
Electrical safety	Section 4B - Electrical Safety Practices MN471004 - Electrical Safety Manual
Electromagnetic energy	MN471004 - Electrical Safety Manual - Chapter 4 - Research Development-Specific Requirements
Electrostatic energy	MN471011 - Sandia Explosives Safety Manual Chapter II - Operational Safety - Part 1 , Part 3 Appendix G - Storage Review Matrices

 <p><u>Emergency</u></p>	<p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p> <p>Chapter 15 - Emergency Preparedness and Management</p> <p>Chapter 15 - Attachment 15-1 - What to Do During an Emergency</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3</p>
<p>Energetic material</p>	<p>MN471011 - Sandia Explosives Safety Manual - Chapter VIII - Formulation Scaleup</p>
<p>Energized equipment</p>	<p>Section 4C - Lockout/Tagout and Administrative Control Locking</p> <p>GN470037 - Lockout/Tagout Procedure for the Control of Hazardous Energy</p> <p>MN471004 - Electrical Safety Manual</p> <p>Chapter 2- General Requirements</p> <p>Chapter 3 - Facility Specific Requirements</p>
 <p><u>Ergonomics</u></p>	<p>Section 6V - Ergonomics</p>
<p>ES&H Program (who and where it applies)</p>	<p>Section 1B - What Is the Scope</p>
<p><u>Etiologic agent</u></p>	<p>Section 19C - Mixed Waste Management</p>
 <p>Evacuation</p>	<p>Chapter 6 - Attachment 6I-4 - Attendant Instructions</p> <p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p> <p>Section 10F - Oils, Greases, Fuels</p> <p>Chapter 15 - Emergency Preparedness and Management</p> <p>GN470072 - Nuclear Criticality Safety</p> <p>GN470100 - Safe Handling of Cryogenic Fluids</p> <p>MN471016 - Radiological Protection Procedures Manual - Chapter 11 - Radiological Incidents</p>

Excavations

Chapter 1 - [Attachment 1D-4](#) - Management Responsibilities for Minors

[Section 4H](#) - Excavations, Trenches, and Floor or Wall Penetrations

[Section 10B](#) - National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties

[GN470097](#) - Operating Light and Heavy Earth Moving Equipment

Explosives

Chapter 1 - [Attachment 1D-3](#) - Standing ES&H Committees

[Section 4E](#) - Hot Work Safety

[Chapter 5](#) - Fire Protection

[Chapter 9](#) - Explosives Safety

[Section 10B](#) - National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties

[Chapter 12](#) - Packaging and Transportation of Hazardous Material

[Section 19A](#) - Hazardous Waste Management

[GN470075](#) - Guidelines for Waste Generators at SNL/CA

[GN470094](#) - Handling Chemicals at SNL/CA

MN471004 - Electrical Safety Manual

[Chapter 4](#) - Research Development-Specific Requirements

[Chapter 5](#) - Special Occupancies

[MN471011](#) - Sandia Explosives Safety Manual

[MN471018](#) - Conduct of Operations Manual: Explosives Operations

Extension cords



[Section 4B](#) - Electrical Safety Practices

MN471004 - Electrical Safety Manual - [Chapter 2](#) - General Requirements

**Eye injury/
potential**[Section 4E](#) - Hot Work Safety[Section 4L](#) - Personal Protective Equipment (PPE)[Section 4T](#) - Firearms Safety[Section 6G](#) - Lasers and Intense Light[Section 6M](#) - Safety Showers and Eyewashes[Attachment 6V-6](#) - Using Video Display Terminals (VDTs)[GN470086](#) - SNL Bloodborne Pathogens Exposure Control Plan[GN470094](#) - Handling Chemicals at SNL/CAMN471011 - Sandia Explosives Safety Manual - [Chapter IV](#) - Personal Protective Clothing & Equipment**F****Face injury/
potential**[Section 4L](#) - Personal Protective Equipment (PPE)[Section 4N](#) - Industrial Machine and Portable Power Tool Safety[Section 10A](#) - Pressurized Drums[GN470086](#) - SNL Bloodborne Pathogens Exposure Control Plan[GN470094](#) - Handling Chemicals at SNL/CAMN471004 - Electrical Safety Manual - [Chapter 4](#) - Research and Development-Specific Requirements**Falls (slips/trips)**[Chapter 3](#) - Office Safety**Fall hazard
(working at an
elevation, etc.)**[Section 4F](#) - Ladders, Scaffolds, and Elevating Work Platforms[Section 4G](#) - Fall Prevention/Fall Protection**Falling objects**[Section 4L](#) - Personal Protective Equipment (PPE)[Section 4P](#) - Housekeeping


Feedback and Improve	<p>Section 2E - Feedback and Improve</p> <p>Chapter 22 - Feedback and Improvement Processes</p>
Firearms and ammunition	<p>Section 4T - Firearms Safety</p>
Fissile material	<p>GN470072 - Nuclear Criticality Safety</p>
First aid kits	<p>Chapter 16 - Benefits and Health Services</p>
Flame	<p>Section 4E - Hot Work Safety</p> <p>Chapter 5 - Fire Protection</p>
Flammable dust or particulate	<p>Section 4E - Hot Work Safety</p> <p>Section 4L - Personal Protective Equipment (PPE)</p> <p>Section 4L - Attachment 4L-1 - Eye and Face Protection Recommendations</p> <p>Section 6P - Local Exhaust Ventilation (LEV)</p> <p>GN470094 - Handling Chemicals at SNL/CA</p> <p>MN471011 - Sandia Explosives Safety Manual Chapter II - Operational Safety - Part 1, Part 2, Part 3</p>
Flammable gas or vapor	<p>Section 4E - Hot Work Safety</p> <p>Section 6P - Local Exhaust Ventilation (LEV)</p> <p>GN470040 - Operating Forklifts and Motorized Hand Trucks</p> <p>GN470094 - Handling Chemicals at SNL/CA</p> <p>GN470094 - Attachment P - Hazardous Properties of Some Gases</p> <p>GN470100 - Safe Handling of Cryogenic Fluids - Attachment A - Hazards Associated with Inert Cryogenic Liquids</p> <p>MN471000 - Pressure Safety Manual - Chapter 5 - Selecting and Assembling Pressure Hardware</p>
Flammable liquid	<p>Chapter 5 - Fire Protection</p>

Floor/wall penetrations	Section 4H - Excavations, Trenches, and Floor or Wall Penetrations
Foot protection	Section 4L - Personal Protective Equipment (PPE)
Forklift operations	Section 4J - Material Handling - Cranes, Hoists, and Forklifts
Fragments	MN471011 - Sandia Explosives Safety Manual Chapter II - Operational Safety - Part 2 , Part 3 Chapter VI - Quantity-Distance Level-of-Protection Criteria for Explosives Activities
Friction	MN471011 - Sandia Explosives Safety Manual Chapter I - Introduction Chapter II - Operational Safety - Part 2 Chapter VIII - Formulation Scaleup Appendix G - Storage Review Matrices
Fuel, oil, grease	See Oil, fuel, grease
Fuel-fired generators	Section 17B - Air Permits in Bernalillo County, New Mexico
G	
Grease, oil, fuel	See Oil, fuel, grease
H	
Halogenated hydrocarbons	Attachment 19A-3 - Examples of Potentially Incompatible Waste GN470094 - Handling Chemicals at SNL/CA - Attachment H - Incompatible Chemicals
Hand protection	Section 4L - Personal Protective Equipment (PPE) GN470100 - Safe Handling of Cryogenic Fluids
Handling materials or wastes of unknown origin	Section 4P - Housekeeping
Hantavirus risk	Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)

 Hazard identification	<p>Section 2B - Analyze Hazards</p> <p>Section 13A - Hazards Identification and Classification Process</p> <p>Section 13B - Hazards Analysis Process</p> <p>Section 13C - Authorization Basis Process</p> <p>Section 13D - Readiness Review Process</p>
<u>Hazardous atmosphere</u>	<p>Section 6I - Confined Space Entry</p>
<u>Hazardous chemicals</u> (see definitions for Physical hazard or Health hazard)	<p>See Chemicals, hazardous</p>
<u>Hazardous material (HAZMAT) response team</u>	<p>Chapter 12 - Packaging and Transportation of Hazardous Material</p> <p>Chapter 16 - Benefits and Health Services</p> <p>Section 6C - Respiratory Protection</p> <p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p>
<u>Hazardous waste cleanup operations (environmental restoration [ER] sites)</u>	<p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p> <p>MN471016 - Radiological Protection Procedures Manual - Chapter 2 - Posting and Labeling for Radiological Control</p>
 <u>Hazardous waste operations at treatment, storage, and disposal (TSD) facilities</u>	<p>Section 6D - Hazard Communication Standard</p> <p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p>
<u>Hazardous waste, < 90 day accumulation area</u>	<p>Section 19A - Attachment 19A-1 - Managing Hazardous Waste at a Less-Than-90-Day Accumulation Area</p>

Hazardous waste generation	Section 19A , Hazardous Waste Management GN470075 - Guidelines for Waste Generators at SNL/CA
Hazards, control	Section 2C - Control Hazards
HAZWOPER	Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)
Head protection	Section 4L - Personal Protective Equipment (PPE)
Heat stress	Section 4L - Personal Protective Equipment (PPE)
Hoists	Section 4J - Material Handling - Cranes, Hoists, and Forklifts
Hot particle	MN471016 - Radiological Protection Procedures Manual - Glossary Chapter 6 - Control of Radioactive Material
Hot work	Section 4E - Hot Work Safety
Human subjects	Chapter 16 - Benefits and Health Services
Hydraulics	Section 4N - Attachment 4N-18 - Hydraulic and Arbor Press MN471000 - Pressure Safety Manual - Chapter 6 - Testing and Evaluating Pressure Systems
I	
Ice (from cryogenic fluids)	GN470100 - Safe Handling of Cryogenic Fluids - Attachment A - Hazards Associated with Inert Cryogenic Liquids
Industrial machine safety	Section 4N - Industrial Machine and Portable Power Tool Safety
Inert gases	MN471000 - Pressure Safety Manual Chapter 5 - Selecting and Assembling Pressure Hardware chapter 9 - Documenting The Operational Safety Of Pressure Systems MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 2



 Ionizing radiation	<p>MN471016 - Radiological Protection Procedures Manual</p> <p>Chapter 1 - Radiological Work Planning and Controls</p> <p>Chapter 3 - Radiological Training Program</p> <p>Chapter 7 - Radiological on Design Control ALARA Application</p> <p>Chapter 12 - Radiation Instrumentation</p> <p>Chapter 14 - Declared Pregnant Workers</p> <p>RP Lessons Learned</p>
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J

	None found
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K

Knowledge of process	<p>Section 10L - Management of Excess Metallic Lead</p> <p>Section 19A - Hazardous Waste Management</p>
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L

 Labeling, chemicals	<p>Section 6D - Hazard Communication Standard</p> <p>Section 6E - Laboratory Standard - Chemical Hygiene Plan</p> <p>Section 10J - Registering, Naming, and Labeling Bulk Storage Tanks</p> <p>Section 19A - Hazardous Waste Management</p> <p>GN470094 - Handling Chemicals at SNL/CA</p>
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Ladders	<p>Section 4F - Ladders, Scaffolds, and Elevating Work Platforms</p>
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Lasers (exposed class 2 or 3a)	<p>Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS)</p> <p>Section 6G - Lasers and Intense Light</p> <p>MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements</p>
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<p>Lasers (class 3b and 4)</p>	<p>Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS)</p> <p>Section 6G - Lasers and Intense Light</p> <p>MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements</p>
<p>Lead</p>	<p>Section 10L - Management of Excess Metallic Lead</p> <p>Chapter 16 - Benefits and Health Services</p> <p>Section 19A - Hazardous Waste Management</p>
<p>Lessons learned, radiation protection</p>	<p>RP Lessons Learned</p>
<p>Lifting</p>	<p>Chapter 3 - Office Safety</p> <p>GN470100 - Safe Handling of Cryogenic Fluids - Attachment A - Hazards Associated with Inert Cryogenic Liquids</p>
<p>Light energy (infrared, intense visible, or ultraviolet)</p>	<p>Section 4E - Hot Work Safety</p> <p>Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS)</p> <p>Section 6G - Lasers and Intense Light</p> <p>Section 6J - Nonionizing Radiation</p> <p>MN471004 - Electrical Safety Manual - Chapter 3 - Facility Specific Requirements</p>
<p>Lighting</p>	<p>Section 4P - Housekeeping</p> <p>Chapter 6, Attachment 6V-6 - Using Video Display Terminals</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1</p>



Lightning

[Section 4B](#) - Electrical Safety Practices

Chapter 15 - [Attachment 15-2](#) - Manager's Checklist

MN471004 - Electrical Safety Manual

[Chapter 1](#) - Introduction

[Chapter 4](#) - Research and Development-Specific Requirements

[Chapter 5](#) - Special Occupancies

MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - [Part 1](#), [Part 2](#)

Lockout/Tagout

[Section 4C](#) - Lockout/Tagout and Administrative Control Locking

[GN470037](#) - Lockout/Tagout Procedure for the Control of Hazardous Energy

MN471004 - Electrical Safety Manual

[Chapter 2](#) - General Requirements

[Chapter 3](#) - Facility Specific Requirements

M

Machinery/shop equipment

(lathes, mills, saws, grinder, etc.)

Section 1D - [Attachment 1D-4](#) - Management Responsibilities for Minors

[Section 4N](#) - Industrial Machine and Portable Power Tool Safety

Magnetic field

Section 4M - [Attachment 4M-2](#) - ISMS Hazard Notice Sign

MN471004 - Electrical Safety Manual - [Chapter 4](#) - Research and Development-Specific Requirements

Material handling equipment

(forklifts, cranes, hoists, hand trucks, etc.)

[Section 4J](#) - Material Handling - Cranes, Hoists, and Forklifts

Material Safety Data Sheet (MSDS)	Section 6D - Hazard Communication Standard Section 6U - Hazardous Material (Chemical and Biological) Inventory
Medical emergency	Chapter 16 - Benefits and Health Services GN470094 - Handling Chemicals at SNL/CA
Mercury	GN470094 - Handling Chemicals at SNL/CA - Attachment H - Incompatible Chemicals
Microwaves	Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS) Section 6J - Nonionizing Radiation MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements
Microwave energy (excluding microwave ovens used for food preparation)	Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS) Section 6J - Nonionizing Radiation MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements
Mixed waste generation	Section 19C - Mixed Waste Management
Motorized hand truck operations	Section 4J - Material Handling - Cranes, Hoists, and Forklifts
Musculoskeletal stressors (awkward positions, repetitive motions, static positions, vibration, etc.)	Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER) Section 6V - Ergonomics
Mutagen	GN470094 - Handling Chemicals at SNL/CA
N	
Noise levels, routine high (continuous or impact; sonic or ultrasonic)	Section 6H - Noise Exposure and Hearing Conservation

Nuclear facilities procedures



[Chapter 8](#) - Occupational Radiation Protection

[Section 13B](#) - Hazard Identification and Analysis

[Section 13C](#) - Authorization Basis Process

[Section 18G](#) - Reporting Nuclear Safety Rule Noncompliances

[GN470072](#) - Nuclear Criticality Safety

[GN470080](#) - Implementing The Unreviewed Safety Question (USQ) Process For Nuclear Facilities

[GN470085](#) - Preparation of Basis for Interim Operations Documents for Existing Nuclear Facilities

[GN470089](#) - Startup and Restart Process for SNL Moderate- and High-Hazard Nonnuclear, Accelerator, and Nuclear Activities

[GN470099](#) - Authorization Agreements (AAs) For Category 1 or 2 Nuclear Facilities Or High-hazard Nonnuclear Facilities

MN471016 - Radiological Protection Procedures Manual

[Chapter 4](#)- Radiation Dosimetry

[Chapter 7](#) - Radiological Design Control ALARA Application



O

Occurrence Reporting

[Section 18C](#) - Occurrence Reporting

Oil, fuel, grease

[Section 10F](#) - Oils, Greases, Fuels

[Section 10J](#) - Registering, Naming, and Labeling Bulk Storage Tanks

[Section 10K](#) - Underground Storage Tanks

Open burn

[Section 17B](#) - Air Permits in Bernalillo County, New Mexico

MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - [Part 3](#)

<u>Onsite packaging and transportation</u> (P&T) or transfer of hazardous material (other than by persons in P&T)	Chapter 12 - Packaging and Transportation of Hazardous Material
<u>Oxidizer</u>	Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS)
Oxygen deficiency or asphyxiation	Section 4W - Asphyxiating Environments
Ozone depleting substances (ODSs)	Section 17D - Ozone-Depleting Substances (ODSs)

P

<u>Packaging</u>	Chapter 12 - Packaging and Transportation of Hazardous Material
Penetration (cutting into walls)	Section 4H - Excavations, Trenches, and Floor or Wall Penetrations
<u>Personal Protective Equipment (PPE)</u>	Section 4L - Personal Protective Equipment (PPE)
Planning work	Section 2A - Plan Work
Pneumatics	Section 4N - Industrial Machine and Portable Power Tool Safety
Power Tool Safety	Section 4N - Industrial Machine and Portable Power Tool Safety
<u>Pressure and vacuum systems</u>	MN471000 - Pressure Safety Manual GN470100 - Safe Handling of Cryogenic Fluids.
Pressurized drums	Section 10A - Pressurized Drums
Process Safety Management (PSM)	Section 6W - Process Safety Management (PSM)

Q




	None found
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R

<u>Radiation-generating device</u>	MN471016 - Radiological Protection Procedures Manual - Chapter 10 - Radiation-Generating Devices
Radiation protection	MN471016 - Radiological Protection Procedures Manual RP Lessons Learned
Radiation Protection lessons learned	See Lessons learned, radiation protection
<u>Radiation, radioactive waste, or mixed waste</u>	Chapter 8 - Occupational Radiation Protection Section 19B - Radioactive Waste Management Section 19C - Mixed Waste Generator Planning GN470075 - Guidelines for Hazardous Waste Generators at SNL/CA
Radiation, survey	MN471016 - Chapter 8 - Monitoring Areas And Material
Radioactive material, disposing	Section 19D - Radioactive Materials Management Areas (RMMAs) GN470072 - Nuclear Criticality Safety GN470075 - Guidelines for Hazardous Waste Generators at SNL/CA MN471016 - Radiological Protection Procedures Manual - Chapter 9 - Control Of Accountable Radioactive Sources
Radioactive waste generation	Section 19B - Radioactive Waste Management
Radio frequency or sub-radio frequency (nonionizing radiation)	Section 4M - Attachment 4M-2 - ISMS Hazard Notice Sign Section 6J - Nonionizing Radiation MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3

Reactive material	<p>Section 19A - Attachment 19A-3 - Examples of Potentially Incompatible Waste</p> <p>Section 19C - Attachment 19C-6 - SNL/NM Mixed Waste Treatability Groups</p> <p>GN470075 - Guidelines for Waste Generators at SNL/CA</p> <p>Attachment A- Hazardous Waste Characteristics</p> <p>Attachment B - Extremely Hazardous Waste</p>
Reactor	<p>Section 13C - Authorization Basis Proces</p> <p>GN470072 - Nuclear Criticality Safety</p> <p>GN470080 - Implementing the Unreviewed Safety Question (USQ) Process For Nuclear Facilities</p> <p>GN470085 - Preparation of Basis for Interim Operations Documents for Existing Nuclear Facilities</p> <p>GN470089 - Startup And Restart Process For SNL Moderate- And High-hazard Nonnuclear, Accelerator, And Nuclear Activities</p> <p>GN470099 - Authorization Agreements (AAs) For Category 1 or 2 Nuclear Facilities Or High-hazard Nonnuclear Facilities</p>
<u>Readiness review</u>	<p>Section 13B - Hazard Identification and Analysis</p> <p>GN470082 - Transition Plan Procedure</p> <p>GN470085 - Preparation of Basis for Interim Operations Documents for Existing Nuclear Facilities</p> <p>GN470089 -Startup And Restart Process For SNL Moderate- And High-hazard Nonnuclear, Accelerator, And Nuclear Activities</p> <p>GN470099 - Authorization Agreements (AAs) For Category 1 or 2 Nuclear Facilities Or High-hazard Nonnuclear Facilities</p>
Refrigerating unit/refrigerant	<p>Section 17D - Ozone-Depleting Substances (ODSs)</p>

Release of any solid, liquid, or gas into the environment or the sewer system	Section 18E - Environmental Release Reporting
Reproductive hazards	Chapter 6 - Industrial Hygiene Chapter 16 - Benefits and Health Services MN471016 - Radiation Protection Procedures Manual - Chapter 14 , Declared Pregnant Workers
Respiratory protection equipment for emergency and rescue use	Section 6C - Respiratory Protection
Rigging	Section 4J - Material Handling - Cranes, Hoists, and Forklifts
Robots or robotic systems (excluding unmodified commercial units)	Section 4N - Industrial Machine and Portable Power Tool Safety
Roof work	Section 4E - Hot Work Safety Section 4G - Fall Prevention/Fall Protection
Rotating parts	Section 4N - Industrial Machine and Portable Power Tool Safety
S	
Sanitation (including eating and drinking)	Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)
Scaffolds	Section 4F - Ladders, Scaffolds, and Elevating Work Platforms

 <p><u>Sealed radioactive material</u></p>	<p>Chapter 12 - Packaging and Transportation of Hazardous Material</p> <p>MN471016 - Radiological Protection Procedures Manual</p> <p>Introduction</p> <p>Chapter 1 - Radiological Work Planning and Controls</p> <p>Chapter 2 - Posting and Labeling for Rad. Control</p> <p>Chapter 9 - Control Of Accountable Radioactive Sources</p>
 <p>Sewer discharge</p>	<p>Section 10H - Discharges to the Sanitary Sewer System</p> <p>Section 10T - Surface and Storm Water Discharges</p> <p>Section 18E - Environmental Release Reporting</p> <p>Section 19B - Radioactive Waste Management</p> <p>Section 19C - Mixed Waste Management</p>
<p>Shear</p>	<p>Section 4N - Attachment 4N-24 - Sheet Metal Shear and Break</p>
<p>Slings</p>	<p>Section 4J - Material Handling - Cranes, Hoists, and Forklifts</p>
<p>Slipping</p>	<p>Chapter 3 - Office Safety</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3</p>
<p>Snakes</p>	<p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p>
<p>Snow, removal</p>	<p>GN470097 - Operating Light and Heavy Earth Moving Equipment</p>
 <p>Solder</p>	<p>Section 6U - Attachment 6U-1 - Barcoding Chemicals</p> <p>Section 19A - Hazardous Waste Management</p>

Solvent 	Section 4G - Fall Prevention/Fall Protection Section 4N - Industrial Machine and Portable Power Tool Safety Section 19A - Hazardous Waste Management Setion 19A - Attachment 19A-3 - Examples of Potentially Incompatible Waste MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1 , Part 2 , Part 3
Spark	MN471011 - Sandia Explosives Safety Manual Chapter II - Operational Safety - Part 1 , Part 2 , Part 3 Chapter IX - Insensitive High Explosives Qualification
Spark hazard	MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1 , Part 2 , Part 3
Steam	MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 2
Storage (flammable or combustible)	Chapter 5 - Fire Protection
Stored energy (pneumatic/hydraulic pressure)	Section 4C - Lockout/Tagout and Administrative Control Locking GN470037 - Lockout/Tagout Procedure for the Control of Hazardous Energy MN471004 - Electrical Safety Manual - Chapter 4 - Research and Development-Specific Requirements
Substance abuse	Chapter 16 - Benefits and Health Services
Surface and storm water discharges	Section 10T - Surface and Storm Water Discharges Section 18E - Environmental Release Reporting
Surface disturbance	Section 17B - Air Permits in Bernalillo County, New Mexico

Suspend work	<p>Section 1D - Attachment 1D-1 - Suspending and Resuming Work</p> <p>Section 4V - ES&H for Contracted Construction and Construction-Like Activities</p> <p>Section 10B - National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties</p>
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T

<u>Technical Work Documents (TWDs)</u>	Chapter 21 - Technical Work Documents (TWDs)
<u>Thermal hazards (industrial heaters, heat tapes, heat guns, furnace or ovens, steam lines, cryogenic fluids, cold surfaces, etc.)</u>	<p>Section 4L - Personal Protective Equipment (PPE)</p> <p>Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER)</p> <p>GN470100 - Attachment A - Hazards Associated with Inert Cryogenic Liquids</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 2</p>
Traffic routes	MN471011 - Sandia Explosives Safety Manual - Chapter VI - Quantity-Distance and Level-of-Protection Criteria for Explosives Activities
Traffic safety	Section 4K - Traffic Safety
Transformer	<p>Section 10J - Registering, Naming, and Labeling Bulk Storage Tanks</p> <p>MN471004 - Electrical Safety Manual</p> <p style="padding-left: 40px;">Chapter 2- General Requirements</p> <p style="padding-left: 40px;">Chapter 5 - Special Occupancies</p> <p>MN471011 - Sandia Explosives Safety Manual</p> <p style="padding-left: 40px;">Chapter II - Operational Safety - Part 1</p> <p style="padding-left: 40px;">Chapter VI - Quantity-Distance and Level-of-Protection Criteria for Explosives Activities</p>

Transportation of hazardous materials (including radioactive material and explosives)	<p>Chapter 12 - Packaging and Transportation of Hazardous Material</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3</p>
Transportation of waste	<p>Chapter 19 - Waste Management</p> <p>GN470075, Guidelines for Hazardous Waste Generators at SNL/CA</p> <p>GN470086 - SNL Bloodborne Pathogens Exposure Control Plan</p>
Trenches	<p>See Excavations</p>
Tripping	<p>Chapter 3 - Office Safety</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 3</p>
U	
Ultraviolet light	<p>Section 4E - Hot Work Safety</p> <p>Section 4M - Attachment 4M-1 - Sandia Workplace Hazards Awareness System (SWHAS)</p>
Underground storage tanks	<p>Section 10J - Registering, Naming, and Labeling Bulk Storage Tanks</p> <p>Section 10K - Underground Storage Tanks</p>
Underwater diving	<p>Section 6F - Commercial Underwater Diving</p>
Unsealed radioactive material	<p>MN471016 - Radiological Protection Procedures Manual - Chapter 9 - Control Of Accountable Radioactive Sources</p>
V	
Vacuum	<p>MN471000 - Pressure Safety Manual</p> <p>Appendix D- Vacuum Safety</p> <p>Appendix H - Suppliers of Quality Pressure Hardware</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 2</p>

Vehicles (motor vehicles)

Section 1D - [Attachment 1D-4](#) - Management Responsibilities for Minors

[Section 4K](#) - Traffic Safety

[Section 4S](#) - Use of Powered Carts

[Section 10F](#) - Oils, Greases, Fuels

[Section 17D](#) - Ozone Depleting Substances (ODSs)

[Section 18F](#) - Reporting Vehicle Accidents and Property Damage

GN470084 - Complying With Federal Motor Carrier Safety Regulations - [Attachment F](#) - Enrolling In The SNL Federal Motor Carrier Safety Regulations (FMCSR) Program

MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - [Part 3](#)

Voltage, common operating (120-160V)

[Section 4F](#) - Ladders, Scaffolds, and Elevating Work Platforms

MN471004 - Electrical Safety Manual - [Chapter 2](#) - General Requirements

Voltage, high (600V or more)

[Section 4F](#) - Ladders, Scaffolds, and Elevating Work Platforms

MN471004 - Electrical Safety Manual

[Chapter 2](#)- General Requirements

[Chapter 3](#) - Facility Specific Requirements

Voltage, standard operating (120V or less)

[Section 4F](#) - Ladders, Scaffolds, and Elevating Work Platforms

MN471004 - Electrical Safety Manual - [Chapter 2](#) - General Requirements

W

[Walking/Working Surfaces](#)

[Section 4P](#) - Housekeeping

Wall penetrations

See [Excavations](#)



<u>Waste, hazardous generation</u>	See Hazardous waste generation
<u>Waste, mixed waste generation</u>	See Mixed waste generation
Waste, non chemical	Section 4P - Housekeeping
Waste, radioactive generation	See Radioactive waste generation
Waste, of unknown origin	<p>Section 19A - Hazardous Waste Management</p> <p>Section 19B - Radioactive Waste Management</p> <p>Section 19C - Mixed Waste Management</p> <p>MN471011 - Sandia Explosives Safety Manual - Appendix G - Storage Review Matrices</p>
Welding	<p>Section 6P - Local Exhaust Ventilation (LEV)</p> <p>See Hot work</p>
Wind	GN470040 - Operating Forklifts and Motorized Hand Trucks
Wiring	<p>Section 4B - Electrical Safety Practices</p> <p>MN471004 - Electrical Safety Manual</p> <p>Chapter 4 - Research and Development-Specific Requirements</p> <p>Chapter 5 - Special Occupancies</p> <p>MN471011 - Sandia Explosives Safety Manual - Chapter II - Operational Safety - Part 1</p>
Work, perform	Section 2D - Perform Work
Work, planning	Section 2A - Plan Work
Working Alone	Section 4A - Working in High-Injury-Potential/Remote Operations
<u>Workplace violence</u>	<p>Chapter 6 - Benefits and Health Services</p> <p>Attachment 5-1 - What to Do During an Emergency</p>
X	
	None found

Y	
	None found
Z	
	None found



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ES&H Manual

SECTION 18E – ENVIRONMENTAL RELEASE REPORTING

Subject Matter Expert: [Joanna Eckstein](#); CA Counterpart: [Robert Holland](#)

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* Indicates a substantive change

- [Applicability](#)
 - [Planned Releases](#)
 - [*Unplanned Releases](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Forms
 - SF 2001-CRR, Chemical/Radioactive Release Information Sheet ([Word file](#)/[Acrobat file](#))
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all work performed at [Sandia-controlled premises](#).

PLANNED RELEASES

Requirements

Managers of operations that involve a planned [release](#) of any process-related solid, liquid, or gas into the environment or sewer system shall:

- Obtain appropriate internal and external approvals.
- Have an approved [technical work document \(TWD\)](#).

Note: These TWDs need to be written and approved in accordance with [Chapter 21](#), "Technical Work Documents (TWDs)."

- Notify the applicable hotline (see [Chapter 15](#), "Emergency Preparedness and Management") before the planned release will occur if it is expected to exceed one quarter of the [reportable quantity](#) for the hazardous material or 0.001 curies of radionuclides over a 24-hour period (25 curies for tritium).

Guidance

Members of the Workforce should contact their [Division ES&H Team](#) for information on reportable quantities.


Managers should contact their [Division ES&H Team](#) for assistance in obtaining approvals for planned releases.

*UNPLANNED RELEASES

Requirements

Members of the Workforce shall immediately report, as per [Chapter 15](#), "Emergency Preparedness and Management," any unplanned [release](#), regardless of amount or location, of any radioactive material or regulated solid, liquid, or gas to the applicable emergency or non-emergency hotlines listed in the tables below:

Emergency Phone Numbers	
Location	Phone
SNL/NM (within KAFB)	911 or 844-0911 (cellular)
SNL/CA	911 or 294-2222 (cellular)



Non-Emergency Phone Numbers	
Location	Phone
SNL/NM (within KAFB)	311 or 844-6515 or 844-0311 (cellular)
SNL/CA	294-3724

See [Section 10E](#), "Chemical Spills", and [Section 10F](#), "Oil, and Fuel Storage," for further information. See the Chemical/Radioactive Release Information Sheet [SF 2001-CRR [\[Word file/Acrobat file\]](#)] for information that will be requested when making the report.

Managers of permitted processes such as air discharges or wastewater discharges shall report, as per [Chapter 15](#), "Emergency Preparedness and Management," any significant deviation from normal operating conditions to the applicable emergency or non-emergency hotlines listed in the tables above. Examples of deviations include:

- Equipment breakdown that causes excess emissions.
- Changes in character or amounts of discharges from processes.
- Interruption of a process to address a situation or release.
- Activation of Site Emergency Response Teams or emergency procedures.
- Unscheduled maintenance that must be reported in advance.

Managers shall direct personnel to preserve, to the extent feasible, and document evidence of accidents involving unplanned releases (see "[Unplanned Conditions or Events and Emergency Response](#)," in Section 2D, "Perform Work").



Guidance

SNL managers should keep copies of any occurrence reports generated by their SNL organization in response to an environmental release.

Members of the Workforce should contact their [Division ES&H Team](#) for assistance in determining whether an unplanned release:

- Is a [reportable quantity](#) under federal regulations.
- Is reportable to state and local agencies.
- Exceeds any permit limits.
- Represents a significant deviation from normal operating conditions.



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to environmental [release](#) reporting include:

Hazard/Activity	Reference
Air emissions	Chapter 17 , "Air Emissions"
Discharges	Section 10E , "Chemical Spills"
	Section 10F , "Oil and Fuel Storage"
	Section 10H , "Discharges to the Sanitary Sewer System"
	Section 10T , "Surface and Storm Water Discharges"

Mixed waste operations	Chapter 19 , "Waste Management" For SNL/CA see GN470075 - Guidelines for Waste Generators at SNL/CA .
Radioactive waste	Section 19B , "Radioactive Waste Management" For SNL/CA see GN470075 - Guidelines for Waste Generators at SNL/CA .



REFERENCES

Requirements Source Documents

[20.6.2 NMAC](#), *Ground and Surface Water Protection*.

[20.11.90 NMAC](#), *Administration, Enforcement, Inspection*.

[40 CFR 112](#), *Oil Pollution Prevention*.

[40 CFR 122](#), *EPA Administered Program: The National Pollutant Discharge Elimination System*.

[40 CFR 302](#), *Designation, Reportable Quantities, and Notification*.



Related Documents

[20.6.4 NMAC](#), *Standards for Interstate and Intrastate Streams*.

[40 CFR 355](#), *Emergency Planning and Notification*.

[40 CFR 370](#), *Hazardous Chemical Reporting: Community Right-to-Know*.

[40 CFR 372](#), *Toxic Chemical Release Reporting: Community Right-to-Know*.

Code of Regulations (CCR) Title 23 Waters, Division 3 [State Water Resources Control Board](#) and Regional Water Quality Control Boards, Chapter 9 Waste Discharge Reports

and Requirements, Chapter 9.2 Reportable Quantities and Reporting Requirements: Section 2550 – Reportable Quantity for Sewage and Section 2551 – Reportable Quantity for Hazardous Waste and Hazardous Substances.

[DOE O 450.1, Chg 1](#), *Environmental Protection Program*.

[DOE M 231.1-1A](#), *Environment, Safety and Health Reporting Manual*.

[DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*.



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ES&H Manual

SECTION 17C – AIR EMISSIONS CONTROL MEASURES

Subject Matter Expert: [Joanna Eckstein](#); CA Counterpart: [Leslee Gardizi](#)

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* Indicates a substantive change

- [*Applicability](#)
 - [*Training](#)
 - [*Air Emissions Control Equipment](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), " What is the Scope."

This section applies to all facilities or operations that have air emissions control equipment as required by either air quality permit conditions and requirements or by federal, state, and local ambient air quality standards.

This section does not apply to SNL/CA. Members of the Workforce at SNL/CA should contact their [Division ES&H Team](#) or the [air quality](#) contact for information about air

emissions control measures at that site.

*TRAINING

Requirements

Managers shall be responsible for:

- Providing air emissions control equipment operators and maintenance personnel with training that is appropriate for the equipment used.
- Maintaining records of such training.

Note: Training may be coordinated with the Technical and Compliance Training Department (3521) or obtained from the equipment manufacturers or vendors.

*AIR EMISSIONS CONTROL EQUIPMENT

Requirements

Managers shall be responsible for:

- Calling the air quality contact prior to the design, contract for purchase, installation, and operation of all air emissions control equipment.
- Ensuring that maintenance of air emissions control equipment is performed.
- Maintaining the following records for as long as the air emissions control equipment to which the permits or regulations pertain is in service or for a minimum of 5 years:
 - Daily readings of air emissions control equipment operating parameters while the activity or process is being performed



- Records of all maintenance activities performed on air emissions control equipment
- OPs and manuals for maintaining and operating air emissions control equipment
- Copies of air emissions control equipment permits or certifications of operations
- Determining the physical and efficiency requirements for air emissions control equipment and basing the design specifications of the equipment on these requirements.



- Developing and implementing OPs for the correct operation of the air emissions control equipment. The procedures shall include the following:

- Physical description of the process and control equipment
- Correct operation of the control equipment
- Routine maintenance requirements
- Periodic readings and recording of operational data (e.g., pressure, temperature, flow)
- Proper ranges for operational data
- Indications of malfunctions or off-normal operations
- Corrective actions for correcting operations that exceed specifications
- Efficiency testing requirements and calculations



- Providing an annual report of air emissions control equipment efficiency and equipment maintenance to the [air emissions inventory](#) contact by January 30 for the previous calendar year.

Members of the Workforce who notice air emissions control equipment failures that result in excess air emissions shall report them immediately to the [air quality](#) contact during operational hours and to the SNL/NM Non-Emergency Hotline at 844-6515 or 311

during non-operational hours.

Guidance

If there are any reporting requirements, managers should ensure that they are based on applicable permit terms or federal, state, or local requirements.

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Air permits in Bernalillo County, New Mexico	Section 17B , "Air Permits"
Exhaust systems	Section 6P , "Local Exhaust Ventilation (LEV)"

*REFERENCES

Requirements Source Documents

[20 NMAC 11.41](#), *Authority-to-Construct Permits*, New Mexico Administrative Code, Albuquerque/Bernalillo County.

[20 NMAC 11.42](#), *Operating Permits*, New Mexico Administrative Code, Albuquerque/Bernalillo County.

[40 CFR 82](#), *Protection of Stratospheric Ozone*.




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ES&H Manual

SECTION 17D – OZONE-DEPLETING SUBSTANCES (ODSs)

Subject Matter Expert: [Joanna Eckstein](#); CA Counterpart: [Leslee Gardizi](#)

MN471001, Issue D

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Administrative Changes: May 4, 1999 and [August 24, 2006](#)

* Indicates a substantive change



- [Applicability](#)
 - [*Training](#)
 - [Purchasing](#)
 - [*Disposal](#)
 - [*Motor Vehicle Air Conditioners \(MVACs\)](#)
 - [*Chillers, Air Conditioners, and Other ODS-Containing Appliances](#)
 - [*Halon-Containing Equipment](#)
 - [*References](#)
-

APPLICABILITY



For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), " What is the Scope."

This section applies to all operations and activities that use any [Class I](#) or [Class II](#) ODSs, or that involve the servicing or [disposal](#) of air conditioning equipment, ODS-containing [appliances](#), or [halon-containing equipment](#).

***TRAINING**

Requirements

Members of the Workforce shall be:

- EPA-certified technicians, as appropriate (i.e., for the type of work to be performed), before:
 - Opening ODS-containing [appliances](#) for maintenance service, repair, or [disposal](#).
 - Repairing, servicing, or disposing of motor vehicle air conditioners (MVACs) or MVAC-like appliances.
- Formally trained regarding [halon](#) release prohibitions before:
 - Servicing [halon-containing equipment](#).
 - Removing halon prior to disposal of halon-containing equipment.

Managers shall be responsible for:

- Ensuring that Members of the Workforce who open MVAC or ODS-containing appliances for maintenance, repair, or disposal are trained and EPA certified.
- Maintaining the following records:
 - Certification training records of EPA-certified technicians within their organization.
 - Training records, as appropriate, if their organization is responsible for

servicing halon-containing equipment.

Guidance

Members of the Workforce should see the [ozone-depleting substances \(ODSs\) contact](#) for assistance in determining appropriate training.

PURCHASING

Requirements

Members of the Workforce shall **not** purchase:

- ODSs (which include [halons](#), chlorofluorocarbons [CFCs], and carbon tetrachloride), except for use in existing refrigerant-containing equipment, fire suppression equipment, or processes for which written exemptions have been received.
- Appliances or equipment that requires the use of ODSs.
- Products with ODS components.
- ODS refrigerant unless they are an SNL designated refrigerant buyer.

Managers shall be responsible for appointing SNL designated refrigerant buyers for operations that require the purchase of ODSs or equipment containing ODSs.

Managers or Members of the Workforce who need an exemption from SNL's policy regarding the use and purchase of ODSs shall be responsible for submitting an exemption request (with justifications) to their vice president and the ES&H Center Director. See the [ozone-depleting substances \(ODSs\) contact](#) for assistance.

Guidance

Managers acquiring new equipment should use commercial alternative material, equipment, and systems if possible. See the [ozone-depleting substances \(ODSs\)](#)

[contact](#) for assistance.



*DISPOSAL

Requirements

Managers shall be responsible for ensuring proper disposal of:

- [Halon](#) and equipment that contains more than a *de minimis* amount of halon by sending it to a manufacturer, recycler, or fire equipment dealer who operates in accordance with NFPA 10 and NFPA 12A standards.
- ODS-containing appliances and motor vehicle air conditioners (MVACs) by having EPA-certified technicians recover ODSs using EPA-approved methods.

Note: ODS-containing appliances that are serviceable do not need to be evacuated prior to reapplication or sale. See CPR 500.2.3, Property/Assets User's Manual, "[Identifying and Removing Excess Property](#)," for more information on reapplication.

Members of the Workforce who dispose of ODS-containing appliances and MVACs shall recover ODSs and label the appliances.

Guidance

Members of the Workforce should **not**, for the sole purpose of complying with the SNL policy, retire equipment that contains halon or refrigerants before the equipment would ordinarily be replaced. See the [ozone-depleting substances \(ODSs\) contact](#) for assistance.



*MOTOR VEHICLE AIR CONDITIONERS (MVACs)

Requirements

Members of the Workforce who repair or service MVACs and MVAC-like appliances shall:

- Use EPA-approved and certified equipment to recover ODSs.
- Be trained and certified by an EPA-approved program.

Managers of operations that service MVACs and MVAC-like appliances shall be responsible for ensuring that refrigerant recycling equipment is approved and registered by the EPA.




Guidance

Members of the Workforce should see the [ozone-depleting substances \(ODSs\) contact](#) for assistance when selecting or testing refrigerant recycling equipment, or with any other relevant concerns about motor vehicle air conditioners.

*CHILLERS, AIR CONDITIONERS, AND OTHER ODS-CONTAINING APPLIANCES

Requirements



Members of the Workforce shall do the following before opening ODS-containing [appliances](#) for service, maintenance, repair, or disposal:

- Observe established evacuation and recycle practices.
- Use EPA-approved equipment.

Members of the Workforce shall **not** alter the design of certified refrigerant recycling or recovery equipment in a way that would affect the equipment's ability to meet EPA requirements without submitting the altered design for recertification testing to the [ozone-depleting substances \(ODSs\) contact](#).

Members of the Workforce who maintain, service, repair, or dispose of ODS-containing

appliances shall not knowingly vent or otherwise release into the environment any [Class I](#) or [Class II](#) ODS used as a refrigerant in that equipment.

Technicians who are certified under an EPA-approved program to maintain, service, or repair ODS-containing appliances shall keep a copy of their certificate at their workplace.

Managers of operations that involve servicing ODS-containing appliances shall be responsible for:

- Determining appropriate evacuation and recycling methods for specific types of appliances.
- Ensuring that the following records are maintained for servicing chillers, air conditioners, and ODS-containing appliances that contain more than 50 pounds of ODSs for 3 years or for as long as needed to comply with the [Sandia Records Retention and Disposition Schedule](#):
 - Records of current EPA-approved training and certification for their Members of the Workforce who operate refrigerant recycling equipment
 - The names and addresses of places where they send their recycled refrigerant
 - Servicing records documenting the date and type of service
 - Records indicating the amount of refrigerant purchased and added
 - Exemption requests and approvals

Guidance

Owners of air conditioning and refrigeration chillers of over 150 tons cooling capacity that use Class 1 refrigerants should plan to retrofit or replace these units by 2005.

Managers of organizations that [recycle refrigerant](#) should maintain records of quantities of recycled refrigerant shipped offsite.

*HALON-CONTAINING EQUIPMENT

Requirements

Members of the Workforce who service [halon-containing equipment](#) shall **not**:

- Manufacture or blend halons

- Knowingly release halon into the environment. This prohibition does not apply to the following circumstances:
 - Emergency discharge of fire extinguishing or explosion inerting equipment.
 - De minimis releases associated with good faith attempts to recover halon.
 - Operation and testing of halon-containing equipment when such tests are essential to demonstrate equipment functionality and when a suitable simulation agent can not be used in place of the halon for technical reasons.

Guidance

Members of the Workforce should see the [ozone-depleting substances \(ODSs\) contact](#) for assistance regarding halon-containing equipment.

*REFERENCES

Requirements Source Documents

[40 CFR 82](#), *Protection of Stratospheric Ozone*.

[Executive Order 12843](#), *Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances*, Federal Register, April 23, 1993.

NFPA 10, *Standard for Portable Fire Extinguishers*, 1994/

NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*, 1997.

Implementing Documents

SNL, PG470192, *Ozone Depleting Substances Management Program*.

SNL, Policy adopted on November 2, 1992 to eliminate purchases of and specifications for ozone-depleting substances by the end of 1995.

Related Documents

EPA430-B-01-001, *Guidance for the EPA Halon Emission Reduction Rule (40 CFR Part 82, Subpart H)*, February 2001.

Richardson, Bill, *Phaseout Goal for DOE's Air-conditioning and Refrigeration Chillers to Protect the Ozone Layer and to Reduce Energy Costs*, memorandum to all DOE Elements, December 10, 1998.

SNL, [MN471010](#), *ES&H Training Catalog*.



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ES&H Manual

SECTION 17E – RADIONUCLIDE NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

Subject Matter Expert: [Mark L. Miller](#); CA Counterpart: [Robert Holland](#)

MN471001, Issue C

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Review: May 24, 2005

Administrative Changes: [June 6, 2005](#)



*Indicates a substantive change

- [Applicability](#)
- [Establishment of Radionuclide National Emissions Standards for Hazardous Air Pollutants \(NESHAP\) Compliance](#)
- [Maintenance of Radionuclide National Emissions Standards for Hazardous Air Pollutants \(NESHAP\) Compliance](#)
- [Related Hazards and Activities](#)
- [References](#)
- Forms
 - SF 2001-RIF, Radionuclide Air Emission Inventory form ([Word file](#)/[Acrobat file](#))



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), " What Is the Scope."

This section applies to activities at SNL/NM and TTR that [release](#) or have the [potential to release](#) radionuclides into the environment through an air emission.

This section does **not** apply to other [Sandia-controlled premises](#). Members of the Workforce at other sites should contact their [Environmental Protection Representative](#) for information about how radionuclide National Emissions Standards for Hazardous Air Pollutants (NESHAP) sources affect their site.

The following are exempt from radionuclide NESHAP requirements:

- Radioactive sources that are located within equipment and used for their intended purposes (and are unmodified).
- [Sealed radioactive sources](#) (see CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*, for more information).

ESTABLISHMENT OF RADIONUCLIDE NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) COMPLIANCE

Requirements

Initiating Compliance

[Source owners](#) shall work with the [radiological NESHAP](#) contact to:

- Identify annual radiological emission limits for facilities (radionuclide emissions to the ambient air shall not exceed those amounts that would cause any member of the public to receive in any year an effective [dose equivalent](#) [EDE] of 10 [mrem](#) per year).

- Identify [radionuclide NESHAP sources](#), evaluate new or modified radionuclide sources, and evaluate the design and development of new facilities for regulatory compliance.
- Establish air emission inventories for radionuclide NESHAP sources before planning to modify:
 - A [facility](#) or begin new [construction](#) that has the potential to be or become a radionuclide NESHAP source.
 - An existing radionuclide source.
- Conduct a preliminary [dose assessment](#).
- Obtain local air quality permits (see [Section 17B](#), "Air Permits," for more information) or federal construction or modification approvals.

Implementing Required Monitoring

Source owners shall ensure that:

- Releases from each radiological NESHAP source that could cause the [maximally exposed individual \(MEI\)](#) to receive an effective dose equivalent (EDE) of greater than or equal to 0.1 mrem per year is monitored according to the requirements in [40 CFR 61](#), Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities*.
- Original logs (i.e., installation, calibration, testing) associated with monitoring equipment are retained for five years.

Developing a Quality Assurance Plan

Source owners shall:

- Work with the [radiological NESHAP](#) contact to ensure that a quality assurance plan is written to document radiological NESHAP compliance activities for radionuclide NESHAP sources at their facility that require monitoring.
- Ensure that this quality assurance plan includes the components specified in [40 CFR 61](#), Subpart H, *National Emission Standards for Emissions of Radionuclides*

Other Than Radon From Department of Energy Facilities.



MAINTENANCE OF RADIONUCLIDE NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) COMPLIANCE

Requirements

Members of the Workforce shall report abnormal or accidental (unplanned) [releases](#) according to procedures in [Section 18E](#), "Environmental Release Reporting."

[Source owners](#) shall:

- Submit a Radionuclide Air Emission Inventory Form (SF 2001-RIF [[Word file/ Acrobat file](#)]) once a year to the [radiological NESHAP](#) contact.
- Notify the [radiological NESHAP](#) contact before modifying, moving, or otherwise altering a radionuclide NESHAP source or associated infrastructure.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to National Emissions Standards for Hazardous Air Pollutants (NESHAP) for radionuclides include:



Hazard/Activity	Reference

Identification of radionuclides in waste	GN470075 , <i>Guidelines for Waste Generators at SNL/CA</i> Section 19B , "Radioactive Waste Management" Section 19D , "Radioactive Material Management Areas (RMMAs)"
Permits for emitting or generating radionuclides	Section 17B , "Air Permits"
Air emissions control measures for radionuclides	Section 17C , "Air Emissions Control Measures"
Planned releases that exceed one quarter of the reportable quantity established by federal regulations for the hazardous material or 0.001 curies of radionuclides over a 24-hour period (25 curies for tritium)	Section 18E , "Environmental Release Reporting"

REFERENCES


Requirements Source Documents

[40 CFR 61](#), Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities*.

Related Documents

ANSI N13.1-1969, *Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities*.

[ANSI/HPS N13.1–1999](#), *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities*.

 ANSI N42.18-1980, *Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents.*


ANSI N323-1978, *Radiation Protection Instrumentation Test and Calibration.*

DOE/EP-0096, *A Guide for Effluent Radiological Measurements at DOE Installations,* July 1983.

EPA, 600/4-77-027b, *Quality Assurance Handbook for Air Pollution Measurement Systems,* Vol. III, "Stationary Source Specific Methods," August 1977.

EPA, 600/9-76-005, *Quality Assurance Handbook for Air Pollution Measurement Systems,* Vol. I, "Principles," Revision 1, January 9, 1984.

SNL, CPR400.1.1.37/[GN470075](#), *Guidelines for Waste Generators at SNL/CA.*

 SNL, CPR400.1.1.21/[GN470089](#), *Startup and Restart Process for SNL Moderate- and High-Hazard Nonnuclear, Accelerator, and Nuclear Activities.*

SNL, CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual.*

SNL, CPR 500.2.1 [Procurement Manual](#).

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ES&H Manual

SECTION 4U - AVIATION SAFETY


Subject Matter Expert: [Stephen Warner](#); CA Counterpart: N/A

MN471001, Issue A

Revision Date: [January 28, 1998](#), Replaces Document Dated: N/A

Administrative Changes: April 2, 2004 and [August 8, 2006](#)

* Indicates a substantive change


- 
- [*Applicability](#)
 - [*Requests for Aircraft Support](#)
 - [*Airworthiness Approval of Flight Subsystems](#)
 - [*Supporting Documentation and Records](#)
 - [*References](#)
 - Attachments
 - [*4U-1](#) - Instructions for Performing a Qualitative Risk Assessment for SNL Aviation Operations
 - [*4U-2](#) - Safety Plan Format
 - Forms
 - SF 2001-AUC, Request for Aircraft Use Support - Sandia/California Helicopter Photographic Charter form ([Word file](#)/[Acrobat file](#))
 - SF 2001-AUN, Request for Aircraft Use Support - Sandia/New Mexico Helicopter Photographic Charter form ([Word file](#)/[Acrobat file](#))
 - SF 2001-AUS, Request for Aircraft Use Support form ([Word file](#)/[Acrobat file](#))
 - SF 9140-A, Determinations and Certification form ([Excel file](#))
-

*APPLICABILITY

For purposes of this chapter, Members of the Workforce are:


- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to the following:

- 
- Requests for [aircraft](#) to support project activities and/or ensure the [airworthiness](#) of aircraft.
 - Use of aircraft owned or leased by DOE and operated by [Ross Aviation](#) in support of project activities.

Note: Ross Aviation flight operations include two Twin Otter aircraft. One Otter generally supports DOE transportation requirements, while the other generally supports research and development (R&D) operations for SNL. The Exploratory Military Systems Center (2500) is the primary user of the Ross "Laboratory" aircraft DHC-6 Twin Otter, N162DE. For information about using the Ross "Laboratory" aircraft (Twin Otter), see the [Ross Aviation aircraft support \(Twin Otter\)](#) contact.

The aviation safety portion of this document does **not** apply to:

- 
- Routine shipment of material and travel by passengers on scheduled commercial air carriers, which are addressed by [DOT](#) and [Federal Aviation Administration \(FAA\)](#) regulations and are the responsibility of the air carrier.
 - Use of U.S. Department of Defense ([DoD](#)) aircraft in support of project activities that are governed by the applicable DoD regulations for certifying the airworthiness of [aircraft modifications](#) and for the carriage or release of test articles.

*REQUESTS FOR AIRCRAFT SUPPORT

Requirements



Members of the Workforce who require [aircraft support](#) shall do the following:

Type of Support	Action
Commercial charters	<ol style="list-style-type: none"> 1. Complete one of the following forms, as appropriate, and have it signed by the requester and the manager of the user organization: <ul style="list-style-type: none"> ○ For general aircraft support: Request for Aircraft Use Support form (SF 2001-AUS) (Word file/ Acrobat file) ○ For helicopter photographic support at SNL/NM: Request for Aircraft Use Support - Sandia/New Mexico Helicopter Photographic Charter form (SF 2001-AUN) (Word file/ Acrobat file) ○ For helicopter photographic support at SNL/CA: Request for Aircraft Use Support - Sandia/California Helicopter Photographic Charter form (SF 2001-AUC) (Word file/ Acrobat file) 2. Submit the appropriate request form to the aviation charters contact. 3. Ensure that contract statements of work contain any requirements imposed by the approval process. 4. Develop documentation of the Federal Aviation Administration (FAA) certifications of the commercial operators,







aircraft, and pilots. Attach copies of the most recent:

- Airman Competency/Proficiency Check form (FAA 8410-3), or equivalent, for each pilot and copilot.
- Medical Certificate form (FAA 8500-9) for each pilot and copilot.
- Air Carrier Certificate form (FAA 8430-18) for charter operator.

Note: See the [aviation charters](#) contact for assistance with FAA forms.

5. Ensure that commercial charter pilots have the following qualifications:


- **Total flight time:** 2,400 hours, including pilot-in-command (PIC), dual instruction, simulator, and second-in-command (SIC), as required by [aircraft type](#).
- **Time in [category of aircraft operated](#):** 1,200 hours, including 100 hours as PIC within the previous 12 months.
- **[Cross country](#):** 500 hours; **not** to include aerial patrols, such as powerline/pipeline operations.
- **Night:** 100 hours as PIC, if night operations are anticipated. PIC flight time shall have included at least three takeoffs and three landings at

	<p>night in the same category and class within the previous 90 days.</p> <ul style="list-style-type: none"> ○ Multi-engine aircraft: 500 hours for airplanes, including 200 hours as PIC, or 250 hours for helicopters.
<p>Work for others (WFO)</p> 	<p>Ensure that a Determinations and Certification Form (SF 9140-DC) is completed for WFO projects.</p> <p>Note: A determination will be made as to the proper review based on the use and involvement of aircraft in the project.</p> <p>Note: See the work for others (WFO) contact for assistance.</p>
<p>Aircraft use which involves mission categories beyond "routine" (Attachment 4U-1, Table 4U-2)</p> 	<p>Prepare a qualitative risk assessment (see Attachment 4U-1 for instructions) and safety plan (see Attachment 4U-2 for the correct format). The risk assessment and the safety plan may be combined with the test plan, depending on the level of effort and detail associated with the project.</p>

Members of the Workforce who request aircraft support shall do the following:

- If mission complexity or aircraft/pilot tasking exceed the scope of the operations outlined in the generic test plan (see note below), a special test plan that includes the basic safety requirements as specified in Attachment 4U-1 shall be submitted to both of the following:
 - The [SNL aviation safety official](#) contact for review.
 - The DOE Transportation Safeguards Division (TSD), for approval. See the [DOE approval and GSA forms](#) contact for assistance.

Note: Normal flight operations for the Exploratory Military Systems Center



(2500) are covered under a set of approved procedures and a generic test plan, and aircraft modifications required pursuant to such operations are made by [Ross Aviation](#) under their own configuration control procedures. The Exploratory Military Systems Center (2500) will not execute any operations that are outside the scope of the generic test plan without an approved special plan. Also, any SNL use of other Ross aircraft for R&D operations shall be covered by an approved test plan.

- After the SNL aviation safety official has reviewed the request:
 - Incorporate any required changes into the safety plan and risk assessment.
 - Amend the contract statement of work, if necessary.
- Upon approval of the request by the [DOE/AL](#) Aviation Program, TSD:
 - Incorporate any additional requirements into the contract statement of work.
 - Process a purchase requisition (PR).
- Prior to the first flight:
 - Prepare a pre-flight operational briefing for aircraft pilots and crew.
 - Make daily notifications, as necessary.
- Upon completion of the flight, fill out the appropriate Government Services Administration (GSA) form:
 - For single or short-term flights: GSA 3551.
 - For long-term flights: GSA 3554.



Guidance

The purchasing process may be initiated at any time during the review and approval of the request for aircraft support. However, if contracts are awarded before the review and approval process has been completed, requesters may have to amend the contract to include all required safety provisions. Work with the appropriate contracting representative when contract amendments are needed.

*AIRWORTHINESS APPROVAL OF FLIGHT SUBSYSTEMS

Requirements

Members of the Workforce shall submit requests to the SNL aviation safety official for [airworthiness](#) approval when any of the following are true (see the [aviation charters](#) contact for assistance):

- Modifications to the aircraft must be made.
- Cabin-mounted equipment is to be added or modified.
- External carriage or release of test articles is involved.

Members of the Workforce who initiate [aircraft modifications](#) or alterations for test/research missions shall ensure that:

- Modifications or alterations are accomplished in accordance with 14 CFR 43, 14 CFR 91, and 14 CFR 135, as appropriate.
- The contract statement of work includes:
 - Any additional requirements of the [aircraft operator](#) resulting from the review process.
 - An aircraft operator-provided [Federal Aviation Administration \(FAA\)](#) Major Repair and Alterations form (FAA 337) , which has been reviewed and approved by the FAA Flight Standards District Office prior to release of the aircraft for operations.
 - Documentation certifying that all equipment and instrumentation to be mounted on or in the aircraft have been approved by a [designated airworthiness representative \(DAR\)](#), [designated engineering representative \(DER\)](#), or equivalent, or that a [technical standard order \(TSO\)](#) for that

equipment is supplied.

- A statement that the aircraft operator is responsible for performing the modifications or alterations, if appropriate.

*SUPPORTING DOCUMENTATION AND RECORDS

Requirements

Members of the Workforce who request or use [aircraft](#) shall ensure that the following documentation is developed and copies are retained as records:

- Request for aircraft use support:
 - **For general [aircraft support](#):** Request for Aircraft Use Support form (SF 2001-AUS) ([Word file](#)/[Acrobat file](#))
 - **For helicopter photographic support at SNL/NM:** Request for Aircraft Use Support - Sandia/New Mexico Helicopter Photographic Charter (SF 2001-AUN) ([Word file](#)/[Acrobat file](#))
 - **For helicopter photographic support at SNL/CA:** Request for Aircraft Use Support - Sandia/California Helicopter Photographic Charter (SF 2001-AUC) ([Word file](#)/[Acrobat file](#))v
- Contract/Charter/Rental Aircraft Cost and Utilization form (GSA 3551) for one-time aircraft use. The original form shall be submitted to [DOE/AL](#) Aviation Program, TSD. (See the [DOE approval and GSA forms](#) contact for assistance.)
- Aircraft Contract/Rental/Charter Support Services Cost Data form (GSA 3554) for [charters](#) that involve multiple aircraft use, including those that occur over an extended period of time. The original form shall be submitted to DOE/OKSO. (See the [DOE approval and GSA forms](#) contact for assistance.)

*REFERENCES

Requirements Source Documents

14 CFR 43, *Maintenance, Preventive Maintenance, Rebuilding, and Alteration.*

14 CFR 91, *General Operating and Flight Rules.*

14 CFR 121, *Operating Requirements: Domestic, Flag, And Supplemental Operations.*

14 CFR 135, *Operating Requirements: Commuter and On-Demand Operations.*

49 CFR, *Transportation.*

[DOE O 440.2](#), *Aviation.*

OMB Circular A-126, *Improving the Management and Use of Government Aircraft*, May 22, 1992.

Implementing Documents

DOE/AL, *Aviation Implementation Plan.*

SNL, [PG470218](#), *Worker Protection Program (WPP).*

Related Documents

14 CFR 125, *Certification and Operations: Airplanes Having a Seating Capacity of 20 or More Passengers or a Maximum Payload Capacity of 6,000 Pounds Or More.*

14 CFR 127, *Certification and Operations of Scheduled Air Carriers with Helicopters.*

14 CFR 133, *Rotocraft External-Load Operations.*

14 CFR 137, *Agricultural Aircraft Operations.*

14 CFR 145, *Repair Stations*

SNL, [CPR200.2.1](#), *Work For Others Manual*.

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ES&H Manual

SECTION 6B - ASBESTOS

Subject Matter Expert: [Anna Lee](#); CA Counterpart: [David Ross](#)

MN471001, Issue F

Revision Date: [May 8, 2006](#); Replaces Document Dated: July 15, 1998

Review Date: May 1, 2006

* Indicates a substantive change

- [*Applicability](#)
 - [*Asbestos Control](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

Note: This section applies to activities involving housekeeping (e.g., custodial work and maintenance) at [Sandia-controlled premises](#).

Note: For research activities handling asbestos, see CPR400.1.1/MN471001, *ES&H Manual*, [Section 6D](#), "Hazard Communication Standard" and CPR400.1.1/MN471001, *ES&H Manual*, [Section 6E](#), "Laboratory Standard – Chemical Hygiene Plan."

*ASBESTOS CONTROL

Requirements

The following table summarizes training requirements for potential [asbestos exposures](#):

Role or Work Activity	Required	Recommended
Housekeeping (e.g., custodial work, maintenance) in areas that have or may have asbestos-containing material	HAZ214	N/A
Work above ceilings or work affecting wall or floor surfaces that may contain asbestos	HAZ214	N/A

Members of the Workforce shall see the [asbestos](#) contact to:

- Determine the location of asbestos-containing material before performing work above ceilings or work affecting wall or floor surfaces that may contain asbestos or that may possibly disturb asbestos-containing material.
- Answer facilities-related asbestos questions.
- Arrange for facilities-related asbestos abatement.

Guidance

Members of the Workforce should contact their [Division ES&H Team](#) for questions about the following:

- Potential exposure to asbestos or asbestos-containing material
- Disposal of waste containing asbestos

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Chemical hazards	Section 6D , "Hazard Communication Standard"
Responding to accidents and injuries	Chapter 16 , "Health, Benefits, and Employee Services"
Procedures for reporting occurrences	Section 18C , "Occurrence Reporting"

REFERENCES

Requirements Source Documents

[29 CFR 1910.1001](#), *Asbestos*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

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ES&H Manual

SECTION 4W - ASPHYXIATING ENVIRONMENTS

Section 4W, "Asphyxiating Environments," was **archived** on May 23, 2005.

The information formerly contained in Section 4W can be found in the following segments of CPR400.1.1/MN471001, *ES&H Manual*:

- [Section 4D](#), "Pressure Safety Operations."
- [Chapter 5](#), "Fire Protection."
- [Section 6D](#), "Hazard Communication Standard."
- [Section 6E](#), "Laboratory Standard—Chemical Hygiene Plan."
- [Section 6I](#), "Confined Space Entry."



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SECTION 4P - HOUSEKEEPING

Subject Matter Expert: [Mark Warner](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue C

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* Indicates a substantive change

- [*Applicability](#)
 - [Good Housekeeping Practices](#)
 - [Spills](#)
 - [Handling Materials](#)
 - [*Recycling](#)
 - [Reapplication](#)
 - [Safe Disposal of Nonchemical Wastes](#)
 - [Disposal of Hazardous Wastes and Waste Minimization](#)
 - [Use Elevated Surfaces Safely](#)
 - [Housekeeping for Construction Activities](#)
 - [*Related Hazards and Activities](#)
 - [*References](#)

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all processes, operations, and tasks performed in the workplace.

GOOD HOUSEKEEPING PRACTICES

Requirements

Members of the Workforce shall keep all places of employment, passageways, storerooms, and service rooms clean, orderly, and in a sanitary condition.

Guidance

Good [housekeeping](#) reduces carelessness and clutter, the most common causes of fires and accidental injuries; provides a visual indication of a safe, efficient workplace; and improves morale. Good [housekeeping](#) includes:

- Properly maintaining and storing items within the workplace.
- Observing safety precautions.
- Picking up, wiping up, sweeping up, and removing scrap and waste from all places of employment, including passageways, storerooms, and service rooms.

The following table contains recommended good [housekeeping](#) practices for some items.

Item	Housekeeping Practice
Lighting Fixtures	Keep light fixtures and bulbs bright and clean. Keep hanging and free-standing lamps free of obstructions and combustibles. Contact Telecon to place a work request for cleaning lights and fixtures, if necessary.
Tools/Equipment	Treat tools and equipment as follows: <ul style="list-style-type: none"> • Clean dirt and oil from tools and equipment after using them. • Return tools and equipment to their proper places. • Close cabinet doors and drawers, and keep them closed. • Repair or replace broken tools.
Industrial Machines	Members of the Workforce should keep industrial machines clean. See Section 4N , "Industrial Machine and Portable Power Tool Safety", for information on cleaning industrial machines.
Personal Protective Equipment	Keep personal protective equipment clean and properly stored. See Section 4L , "Personnel Protective Equipment (PPE)", for more information.

Walking/Working Surfaces

Maintain walking/working surfaces as follows:

- Clean messy areas and remove trash.
- Keep aisles, hallways, and exit routes free of clutter and obstructions.
- Eliminate tripping hazards.
- Clean up all spills and leaks. See "[Spills](#)" for spills of hazardous materials.
- Prevent, watch out for, and avoid slick indoor surfaces, especially when wet. Examples include entranceways, painted or waxed floors, metal door sills and steps, plastic carpet protectors, and restroom floors. Post warnings as necessary.
- Keep temporary storage out of aisles, hallways, exit routes, and work spaces.
- Store materials and equipment in cabinets, shelves, or bookcases whenever possible.
- Store empty boxes and packing material properly. Do not allow these items to accumulate.



SPILLS

Guidance

Members of the Workforce may clean up a spill.

- See [Section 10E](#), "Chemical Spills," for information on cleaning up and reporting chemical spills.
- See [Section 10F](#), "[Oil and Fuel Storage](#)," for further information on cleaning up and reporting material spills.

- [GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, for more information on cleaning up spills at SNL/CA.

HANDLING MATERIALS

Guidance

The following are [housekeeping](#) guidelines for materials handling:

- Store materials properly. Proper stacking and storage can prevent objects from falling.
- Keep paper products, supplies, [flammable liquids](#), and hazardous substances in labeled containers, and store them in designated storage areas. Use [secondary containment](#) whenever the potential exists for accidental release to the environment.
- Provide impact barriers in spaces where material-handling equipment is used. Impact barriers can reduce the danger of knocking stacked materials over and damaging storage racks.
- Keep stored items away from openings; do not stack them above barriers.
- Provide adequate work space and traffic aisles to minimize the danger of running into stacked items.

*RECYCLING

Requirements

Scrap metal from a radiological area or volumetrically contaminated metal shall be subject to requirements in [Section 10U](#), "Scrap Metal From a Radiological Area or Volumetrically Contaminated Metal".

Guidance

Recycling at SNL/NM

Many items may be recycled at SNL/NM, these include:

- White bond, computer, and copier paper, flip chart paper, white ruled pad paper, white engineering paper with blue lines, and certain light-colored paper (i.e., tan, ivory, grey, blue, buff, and ecru). Box the paper, seal the box, and place the box in the outdoor cage provided for paper recycling.
- Corrugated cardboard (not single-layer pasteboard) and brown paper bags. Break down (flatten) the boxes and place boxes and brown paper bags in the outdoor cage provided for cardboard recycling.
- Phonebooks - Qwest (both white and yellow) and SNL. Place phonebooks in the bins provided annually for this purpose by the phone company.
- Styrofoam[®] packing peanuts. Hand-carry to the Shipping Team (10263-3), Building 957, or bag them up and put them in the trash.
- [Toner cartridges](#) for copiers, printers, and fax machines (except those color toner cartridges and 18" x 3" tubular, bulk toner cartridges for large office copiers). Call 844-4121 for recorded information and to request pickup.
- Aluminum cans. Call the [recycling coordinator](#) for instructions on starting an aluminum can recycling

program.

- Scrap metals - stainless steel, copper, iron, aluminum (other than cans), lead, and zinc.
- Precious metals - gold, silver, and platinum.
- Engine motor oil (see [Section 19A](#)).
- Tires.
- Most batteries . Contact the Fleet Services Department's ES&H Coordinator (7849) for information about recycling batteries. See [Section 19A](#), "Hazardous Waste Management", for guidance about disposing of consumer batteries.
- Paper items - the Lab News, Sandia Labs Weekly Bulletins, white envelopes without windows.

Wastepaper Recycling at SNL/NM

The following are guidelines for wastepaper recycling:

- Paper recycling is voluntary; however, because SNL is mandated to reduce landfill use, recycling is strongly encouraged.
- Participants should coordinate their efforts with the custodians.
- Custodians and building ES&H coordinators select locations for boxes of paper for recycling.
- Custodians will pick up paper for recycling only in approved recycling boxes or smaller, not to exceed 30 lb when full. For a supply of recycling boxes, contact the [transportation/distribution team](#) contact for a supply of recycling boxes.
- Recycling boxes are to be used for recycling only, not for moving.
- Stack paper in boxes (not quite to the top). Seal boxes to prevent spillage.
- Remove items such as paperclips and Post-it Notes (Reg TM) before placing paper in collection boxes. Staples are permitted, but glue of any kind is prohibited.
- Keep paper collection boxes locally, such as at your desk or near a copier. When boxes are full, move them to the paper collection site or place them in the wire cage provided.
- Designate an individual to check the wire cage and call the [transportation/distribution team](#) contact for pick up when the cage is full.

Cardboard Recycling at SNL/NM

The following are guidelines for cardboard recycling:

- Removing all packaging, such as dividers, foam peanuts, plastic bags, light preformed foam, and other packing material. Seal packing materials in a plastic trash bag and place them in trash dumpsters or turn

them in to the [shipping team](#) contact for reuse.

- Carry cardboard to the pickup location designated by custodians and your building ES&H coordinator. (Any person may break down boxes and place cardboard in the wire cage at the designated pickup location.)
- The [transportation/distribution team](#) contact picks up the cardboard and prepares it for recycling. If the wire cage is full of cardboard, call [Telecon](#) for pick up when the cage is full.

For more information about recycling at SNL/NM, contact the [recycling coordinator](#).

What May Not Be Recycled at SNL/NM

Some items **may not** be recycled at SNL/NM and may be thrown in the trash. These include:

- Outdated software manuals.
- Magazines, catalogs, newspapers, and most glossy paper.
- Colored paper or paper with glue (such as Post-it (Reg TM)).
- Plastic.
- Computer data diskettes, including outdated software. Cut these up (see instructions in the [Computer Security Desk Reference](#)).

Recycling at SNL/CA

Organizations throughout SNL/CA participate in wastepaper recycling. To recycle wastepaper, use the following guidelines:

- Recycle white, light-colored, carbonless, slick, and glossy paper; envelopes, both with and without windows; open and sorted mail; and light-colored file folders.
- **Do not recycle** unbleached, natural/brown, dark-colored, fluorescent-colored, "goldenrod" (deep mustard yellow), waxed, or plastic-coated paper; brown or tan envelopes; newspapers; magazines; blueprints; or non-office paper products such as napkins, paper plates, and paper towels.
- Address questions about acceptable paper for recycling to the [waste minimization/pollution prevention coordinator](#) contact (SNL/CA).
- Obtain recycling boxes by calling the [facilities operations](#) (SNL/CA) contact in the ES&H Direct Services list. Boxes are available in desktop, medium, and jumbo sizes.
- The [maintenance engineering](#) contact in the ES&H Direct Access Services list picks up the paper in the recycling boxes as needed.

Other recycling programs at SNL/CA include those for the following materials:

- Scrap metal
- Aluminum cans
- Glass (from laboratories)
- [Toner cartridges](#)
- Lead acid batteries
- Oil and machine coolants
- Oil filters
- Tires
- Fluorescent light tubes

For more information about recycling at SNL/CA, call the [waste minimization/pollution prevention coordinator](#) (SNL/CA) contact.

Recycling at TTR and KTF

For information on recycling at KTF, contact Kauai Test Facility (KTF) Range Support Team (2419-1). For information on recycling at TTR, contact the Tonopah Test Range Department (9719).

REAPPLICATION

Requirements

Chemical Exchange Program

The Chemical Exchange Program is part of SNL's waste minimization effort. As with any hazardous material, only the amount necessary to perform the desired task shall be purchased and/or kept on hand.

Guidance

Contacting the Chemical Exchange Program

Members of the Workforce may call one of the [Chemical Exchange Program](#) contacts in the ES&H Direct Services Access list to get a listed chemical, if they are looking for a chemical not on the list, or if they have unopened, unexpired surplus chemicals to contribute to the Chemical Exchange Program.

At SNL/NM, please consult the [Chemical Exchange Program](#).

At SNL/CA, the Chemical Exchange Program is part of the Chemical Inventory System. Members of the

Workforce may obtain listings of chemicals available for exchange by calling the [Chemical Exchange Program](#) contact.



SAFE DISPOSAL OF NONCHEMICAL WASTES

Requirements

Smoking Materials

Members of the Workforce shall properly dispose of cigarettes, cigars, and matches by doing the following:

- Disposing of expended smoking material in specially-designed receptacles. Call the [smoking materials receptacle](#) contact for information on receptacles for expended smoking materials.
- Using receptacles designed for outdoors.
- Placing receptacles at locations where smoking is authorized.



Heavy Items

Members of the Workforce shall not fill trash containers so that they exceed 60 lb. For information on disposing of heavy items, contact the [heavy items](#) contact.

Glass or Sharp Objects

The manager shall designate a specific local collection area for glass and sharp objects.

Members of the Workforce shall dispose of glass items by:

- Placing the item in boxes or other substantial containers provided for that purpose
- Placing the box or other containers in a dumpster
- Labeling trash containers by contents (e.g., "GLASS"), and seal them to reduce the personnel hazards associated with disposal if left for disposal by custodians.

Information on disposing of glass is available from the [glass disposal](#) contact.

Loose Items

Members of the Workforce shall place loose items in trash bags before placing them in dumpsters to prevent them from being scattered by the wind.

Guidance



Area Cleanup

Members of the Workforce may request exterior area cleanup (for materials such as tumbleweeds, trash buildup, debris, and pallets). For information on obtaining area cleanup, at SNL/NM, call [Telecon](#); at SNL/CA, call the [maintenance engineering](#) contact.

Cleanup Campaigns

Cleanup campaigns are held periodically as determined by management. Each organization designates a cleanup campaign person to collect as much refuse as possible from both inside and outside of each facility.


DISPOSAL OF HAZARDOUS WASTES AND WASTE MINIMIZATION



Requirements

Members of the Workforce shall not introduce any toxic or hazardous materials into the sanitary waste system or dispose of them in solid waste containers. Promptly identify and dispose of hazardous waste, chemical waste, and empty and nonempty containers containing chemical waste according to the guidelines of the following *ES&H Manual* sections and supplements:

- [Section 10E](#), "Chemical Spills."
- [Section 10F](#), "Oil and Fuel Storage."
- [Section 19A](#), "Hazardous Waste Management."
- [GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.



Members of the Workforce shall not bring household trash onto Sandia-controlled premises for disposal.

USE ELEVATED SURFACES SAFELY

Requirements

Members of the Workforce shall use the following safe practices for activities that involve elevated surfaces, such as mezzanines and walkways:

- Do not let objects such as tools, waste, and other items accumulate on an elevated surface; there is a chance that they will fall to the surface below.
- Ensure that the standard guardrail has a toeboard to prevent objects from falling.

- Provide a fall zone, which is a fenced or guarded area that people at lower levels cannot enter. Debris should fall into the fall zone, where it will not strike anyone. The guarding should consist of overhead and side protection that is strong enough to provide protection from objects that might fall. Side protection should protect occupants from splattering or scattering material.

HOUSEKEEPING FOR CONSTRUCTION ACTIVITIES

Requirements

To ensure the safety of construction workers and the public, Members of the Workforce performing construction activities shall comply with [29 CFR 1926.25](#) as follows:

- Keep form lumber, scrap lumber with protruding nails, and all other debris clear from work areas, passageways, stairs, buildings, or other structures during the course of construction, alteration, or repairs.
- Provide safe means to remove debris.
- Remove garbage and combustible scrap and debris at regular intervals during the course of construction. See "[Safe Disposal of Nonchemical Wastes](#)."
- Provide containers for the collection and separation of waste, trash, oily and used rags, and other refuse.
- Use containers equipped with covers for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc., and keep the containers closed when not using them.
- Secure construction material during high wind periods.
- Ensure that construction materials and debris do not interfere with egress from the site.

*RELATED HAZARDS AND ACTIVITIES

Other hazards that may be present with processes, operations, and tasks performed in the workplace include:

Hazard/Activity	Reference
Fire	Chapter 5 , "Fire Protection"
Spilled chemicals	Section 10E , "Chemical Spills"
Cuts from broken glass	Chapter 16 , "Health, Benefits, and Employee Services"
Adverse environmental impact	Section 18E , "Environmental Release Reporting"
Obstructions that interfere with egress	Chapter 5 , "Fire Protection"
Obstructions that can cause tripping	Chapter 3 , "Office Safety"

Excessive "fuel loading" of ordinary combustibles, which can either create or contribute to a fire hazard.	Chapter 5 , "Fire Protection"
Hazardous waste	Section 19A , "Hazardous Waste Management"
Explosive waste	MN471011, <i>Sandia Explosives Safety Manual</i> , Chapter II , "Operational Safety"
Reapplication	CPR 500.2.3, Property/Assets User's Manual, "Identifying and Handling Excess Property."
Office ergonomics	Section 6V , "Office Ergonomics"

*REFERENCES

Requirements Source Documents

[29 CFR 1910.22](#), *Walking-Working Surfaces, General Requirements*.

[29 CFR 1910.1200](#), *Hazard Communication*.

[29 CFR 1926.25](#), *General Safety and Health Provisions, Housekeeping*.

[DOE 5400.1](#), *General Environmental Protection Program*.

*Implementing Documents

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

SNL, [Computer Security Desk Reference](#).

SNL, [GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.



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ES&H Manual

SECTION 6K - HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (HAZWOPER)

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* Indicates a substantive change

- [Applicability](#)
 - [*Training](#)
 - [*Contacting Industrial Hygienists](#)
 - [*Hazardous Waste Cleanup Operations](#)
 - [*Hazardous Waste Operations at Treatment, Storage, and Disposal \(TSD\) Facilities](#)
 - [*Emergency Response Operations](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
-

APPLICABILITY

For purposes of this document, [Members of the Workforce](#) are:

- Sandia [employees](#).

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to hazardous waste operations and [emergency response](#) (HAZWOPER) activities at [Sandia-controlled premises](#).



*TRAINING

Requirements

Role or Work Activity	SNL/NM	SNL/CA
General site workers ^c	ENV100a ENV100X^{ab} ENV103a	ENV100a ENV100X^{ab} ENV103a
Occasional workers ^d	ENV102a ENV102X^{a,b} ENV103a	N/A
Onsite management or supervision of Members of the Workforce engaged in hazardous waste cleanup operations	ENV100a ENV100X^{ab} ENV104a	ENV100a ENV100X^{ab} ENV104a
Treatment , storage , and disposal (TSD) facility workers ^e	ENV102a ENV103a	ENV102a ENV103a
Hazardous material technicians ^f	EMG103a ENV103a	N/A



^a Any vendor whose course complies with requirements in [29 CFR 1910.120\(a\) through \(q\)](#) and who provides documentation stating that fact is considered a valid vendor.

^b A trained, experienced field supervisor who has completed [ENV104](#) shall conduct this on-the-job training.

^c "General site workers" are persons who are engaged in [hazardous substance](#) removal (cleanup operation) or other activities which expose or potentially expose workers to hazardous substances and health hazards during cleanup operations.

^d "Occasional workers" are

- Persons on a [hazardous waste site](#) only occasionally for a specific, limited task and who are unlikely to be exposed over permissible exposure limits and published exposure limits, or are
- Persons regularly on site at a hazardous waste site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible and published exposure limits (where respirators are unnecessary), there are no existing health hazards, and there is no possibility for the development of an emergency.

^e "Treatment, storage, and disposal facilities (TSD) workers" are persons who may be exposed to health hazards or [hazardous substances](#) at TSD operations.

^f "Hazardous material technicians" are individuals who respond to [hazardous substance](#) releases or potential releases for the purpose of stopping the release. These individuals assume an aggressive role and approach the point of release in order to stop the release of a hazardous substance.

[Members of the Workforce](#) who perform [post-emergency response](#) and have **not** implemented requirements in [29 CFR 1910.120\(b\) through \(o\)](#) shall complete training requirements in the following:

- [29 CFR 1910.38\(a\)](#).

- [29 CFR 1910.134.](#)
- [29 CFR 1910.1200.](#)
- Other appropriate safety and health training made necessary by tasks they are expected to perform, such as [personal protective equipment \(PPE\)](#) and decontamination procedures

*CONTACTING INDUSTRIAL HYGIENISTS

Requirements

Managers shall be responsible for contacting the Industrial Hygienist supporting the Division whenever an activity is planned that:

- Involves a new hazardous waste cleanup operation/environmental restoration.
- Involves a new hazardous waste operation at a [treatment](#), [storage](#), and [disposal](#) (TSD) facility.
- Involves a new [emergency response](#) operation for releases, or substantial threats of releases, of [hazardous substances](#).

*HAZARDOUS WASTE CLEANUP OPERATIONS

Requirements

Managers of Members of the Workforce who conduct hazardous waste cleanup operations shall ensure that a safety and health program is written and implemented according to [29 CFR 1910.120\(b\) through \(o\)](#). The program shall include site-specific health and safety plans (HASPs), which shall be kept on site, address health and safety hazards of each phase of site operations, and include the requirements for worker protection.

Managers shall ensure that the safety and health program is designed to:

- Identify, evaluate, and control safety and health hazards.
- Provide [emergency response](#) for hazardous waste cleanup operations.

Members of the Workforce shall conduct hazardous waste cleanup operations according to the safety and health program.



***HAZARDOUS WASTE OPERATIONS AT TREATMENT, STORAGE, AND DISPOSAL (TSD) FACILITIES**

Requirements

Managers of Members of the Workforce who perform hazardous waste operations at [Treatment](#), [Storage](#), and [Disposal](#) (TSD) facilities shall ensure that a safety and health program is written and implemented according to [29 CFR 1910.120\(p\)](#). Managers shall ensure that written safety and health programs:

- Identify, evaluate, and control safety and health hazards in their facilities for the purpose of protecting Members of the Workforce.
- Provide for [emergency response](#).
- Address as appropriate site analysis, [engineering controls](#), maximum exposure limits, hazardous waste handling procedures, and uses of new technologies.

Members of the Workforce who perform hazardous waste operations at TSD facilities shall conduct operations according to [29 CFR 1910.120\(p\)](#) and the safety and health program.



*EMERGENCY RESPONSE OPERATIONS

Note : Managers who evacuate [Members of the Workforce](#) from the danger area when an emergency occurs, and who do not permit any Members of the Workforce to assist in handling the emergency, are exempt from writing an [emergency response plan](#). For more information about evacuating Members of the Workforce, managers should see [Chapter 15](#), "Emergency Preparedness and Management."

Note : These requirements do **not** apply to Members of the Workforce who respond to incidental releases of [hazardous substances](#) (for a description of incidental releases, see the definition of "[emergency response](#)").

Requirements

Managers of [Members of the Workforce](#) who perform [emergency response](#) operations for releases, or substantial threats of releases, of [hazardous substances](#) shall ensure that a written emergency response plan is:

- Developed and implemented according to [29 CFR 1910.120\(q\)](#) to handle anticipated emergencies prior to the commencement of emergency response operations.
- Available for inspection and copying by Members of the Workforce.

Members of the Workforce shall conduct emergency response operations for releases, or substantial threats of releases, of [hazardous substances](#) according to their organization's emergency response plan and procedures in [Chapter 18](#), "Reporting, Investigating, and Correcting ES&H Events."

Managers of [Members of the Workforce](#) who perform [post-emergency response](#) shall ensure that Members of the Workforce do one of the following:

- Meet all requirements in [29 CFR 1910.120\(b\) through \(o\)](#) (see "[Hazardous Waste Cleanup Operations](#)" for more information).
- Complete training requirements for [post-emergency response](#) discussed in "[Training](#)."

Guidance

Managers and [Members of the Workforce](#) should contact their [Division ES&H Team](#) for assistance with the following:

- Specific elements for safety and health programs.
- Site-specific health and safety plans ([HASPs](#)).
- [Emergency response plans](#).
- Appropriate training.
- Compliance with [29 CFR 1910.120](#).

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Chemical hazards	Section 6D , "Hazard Communication Standard"
Chemical spills	Section 10E , "Chemical Spills"
Emergency response	Chapter 15 , "Emergency Preparedness and Management"
Health and safety plans	Chapter 21 , "Technical Work Documents (TWDs)"
Procedures for reporting occurrences	Section 18C , "Occurrence Reporting"
Responding to accidents and injuries	Chapter 16 , "Health, Benefits, and Employee Services"

*REFERENCES

Requirements Source Documents

[29 CFR 1910.38](#), *Emergency Action Plans*

[29 CFR 1910.120](#), *Hazardous Waste Operations and Emergency Response.*

[29 CFR 1910.134](#), *Respiratory Protection.*

[29 CFR 1910.1200](#), *Hazard Communication.*

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*

Implementing Documents

[29 CFR 1910 Subpart Z](#), *Toxic and Hazardous Substances.*

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program.*

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program.*

SNL, [PG470218](#), *Worker Protection Program (WPP).*



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ES&H Manual

*SECTION 6N - BIOLOGICAL AGENTS AND BIOSAFETY

Subject Matter Expert: [Lynn Fondren](#); CA Counterpart: [Susan Weekly](#)

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* Indicates a substantive change

- [Applicability](#)
 - [*Training](#)
 - [*Microorganisms and Biological Toxins](#)
 - [*Select Agents](#)
 - [*Recombinant DNA Molecules](#)
 - [*Plant and Animal Pathogens; Plant Pests and Noxious Weeds](#)
 - [Hantavirus](#)
 - [*Related Hazards and Activities](#)
 - [*References](#)
 - Attachments
 - [6N-1](#), Certification of Noninfectious Material
-

APPLICABILITY

For purposes of this document, [Members of the Workforce \(MOW\)](#) are:

- Sandia [employees](#).

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This document applies to activities on [Sandia-controlled premises](#) that involve the following:

- [Microorganisms](#)
- Microbiological and biomedical laboratories

- [Biological agents](#)
- [Etiologic agents](#)
- [Select agents](#)
- [Recombinant DNA molecules](#)
- [Biological toxins](#)
- Nonpathogenic/avirulent agents

- [Blood](#)
- [Other potentially infectious material \(OPIM\)](#)

- [Risk Group 1 \(RG1\) agents/Biosafety Level 1](#) (BSL-1) agents
- [Risk Group 2 \(RG2\) agents/Biosafety Level 2](#) (BSL-2) agents
- [Plant and animal pathogens](#)
- Noxious weeds
- Pest control
- [Feral](#) animals

- Plant pests



This document does **not** address the following agents and activities. Such activities and agents are beyond the current [Authorization Basis](#) for such activities on Sandia-controlled premises. Consult the [Biological Safety Officer](#) if anticipated work may involve any of these agents or activities:

- [Risk Group 3 \(RG3\) agents](#)
- [Risk Group 4 \(RG4\) agents](#)
- [Biosafety Level 3](#)
- [Biosafety Level 4](#)
- [Prions](#)
- Laboratory animals



*TRAINING

Work Activity or Role	Required	Recommended
Members of the Workforce (MOW) who engage in microbiological laboratory work involving microorganisms and biological toxins .	BIO105	NA
Members of the Workforce who work in laboratories and may be exposed to hazardous chemicals —(including, but not limited to, biological toxins) under normal operating conditions or in foreseeable emergencies.	LAB100	NA

Members of the Workforce whose job duties involve the potential for occupational exposure to blood and other potentially infectious materials (including, but not limited to, human cell lines and unfixed human tissue or organs).	MED113	NA
Members of the Workforce who engage in packaging, transporting or receiving microorganisms or biological toxins, such as personnel in Shipping and Receiving.	Site-specific training ¹	NA
¹ Not a corporate course; contact your Division ES&H Team for this training.		

*MICROORGANISMS AND BIOLOGICAL TOXINS

Requirements

Managers shall:

- Provide a workplace in which microorganisms and [biological toxins](#) have been anticipated, identified, evaluated, and controlled when they pose a [health hazard](#).
- Ensure that [Members of the Workforce \(MOW\)](#) are trained and knowledgeable in appropriate laboratory techniques, safety procedures, and hazards associated with handling microorganisms and biological toxins.

Managers of [MOW](#) who engage in work involving microorganisms and biological toxins shall be responsible for ensuring that applicable portions of the following regulations and standard practices are implemented as appropriate:

- 42 CFR Parts 72 and 73, *Possession, Use, and Transfer of Select Agents and Toxins*, 7 CFR Part 331, and 9 CFR Part 121, *Possession, Use, and Transfer of Biological Agents and Toxins* (applicable to registration, receipt, transfer, disposal, handling, security, and accounting for select agents).

- Health and Human Services , U. S. Department of Centers for Disease Control and Prevention, Publication No. 93-8395, [Biosafety in Microbiological and Biomedical Laboratories](#) (applicable to all work involving microbiological and biomedical laboratories).
- National Institutes of Health, compliance with the [NIH Guidelines for Research Involving Recombinant DNA Molecules](#) (applicable to work involving [recombinant DNA](#)).

 **Note:** The [Biological Safety Officer \(BSO\)](#) shall, upon request, **provide guidance** to managers on interpreting applicable regulations and guidelines.

Managers should contact the appropriate [Division ES&H Team](#) Industrial Hygienist for guidance when work involves microorganisms or biological toxins.

Biosafety or Operations Manual (Technical Work Document)

Requirements

Managers of **Members of the Workforce (MOW)** who engage in work involving [microorganisms](#) and [biological toxins](#) shall **ensure**:

- Biosafety procedures are incorporated into a technical work document (**TWD**) (e.g. standard operating procedure) or are presented in a biosafety manual **which identifies**:
 - Hazards that will or may be encountered.
 - Practices, equipment, facilities and procedures designated to minimize or eliminate exposures to these hazards.
- Affected MOW are advised of special hazards.
- Affected MOW read and follow required practices and procedures.
- The appropriate [Division ES&H Team](#) Industrial Hygienist reviews applicable biosafety manuals or operating procedures prior to initiating work **and refers to the [Biological Safety Officer \(BSO\)](#) if the facility is categorized as Biosafety Level 2**



(BSL-2).

Note: The [BSO](#) shall, upon request, assist managers in interpreting applicable CDC requirements and guidance.

Note : If work is conducted within a BSL-2 facility, then the IH shall conduct the initial review and internally refer to BSO for additional review.

Note : Technical work documents (TWDs) are formally approved administrative controls used to direct work and help control hazards as part of SNL's implementation of the Integrated Safety Management System (ISMS). TWDs identify and evaluate hazards and describe how to mitigate/control these hazards during normal activities or foreseeable emergencies. (See CPR400.1.1/MN471001, *ES&H Manual*, [Chapter 21](#), "Technical Work Documents (TWDs)").



Biosafety Committee Review

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving microorganisms and [biological toxins](#) shall be responsible for ensuring that all proposed work with [Risk Group 2 \(RG2\) agents](#) or [select agents](#) is submitted to the [Biological Safety Officer](#) for review by a [Biosurety Review Committee](#) or an [Institutional Biosafety Committee](#), as appropriate.

Signs

Requirements



Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving [microorganisms](#) and biological toxins shall be responsible for ensuring that:

- The biological hazard warning sign is used to signify the actual or potential presence of a biohazard and to identify equipment, containers, rooms, materials, or combinations thereof, which contain, or are contaminated with, viable hazardous agents. For the purpose of this requirement the term [biological hazard or biohazard](#) includes only those infectious agents presenting a risk or potential

risk to the well-being of man.

- The symbol design for biological hazard tags conforms to the design shown below.



Managers shall contact the appropriate [Division ES&H Team](#) Industrial Hygienist for guidance on signs and tags when work involves microorganisms and biological toxins.

Guidance



The recommended color coding for biological hazard signs and tags is fluorescent orange or orange-red, or predominantly so, with lettering or symbols in a contrasting color.

Inventory

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving [microorganisms](#) and [biological toxins](#) shall be responsible for ensuring that:

- An inventory of microorganisms and biological toxins is maintained in the electronic [Chemical Information System \(CIS\)](#).
- The following information is entered into the CIS using the [Biological Organism/Toxin Inventory Form](#)



- Average quantity of the agent
- Location of the agent
- Whether the agent is cultured on site
- Associated Centers for Disease Control and Prevention (CDC) biosafety level
- Associated National Institutes of Health (NIH) risk group level

Nonpathogenic **or** Avirulent Agents

Requirements

Prior to receiving [etiologic agents](#) that have been rendered nonpathogenic/avirulent through non-destructive means, such as irradiation, on Sandia-controlled premises, managers shall **ensure the following**:

- Obtain documentation of the method used to render the agents nonpathogenic **or** avirulent.
- Obtain documentation confirming that the agents are nonpathogenic **or** avirulent (e.g., culturing with negative results).
- Provide copies of all related documentation to the [Biological Safety Officer](#).

Bloodborne Pathogens

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving [blood](#) or [other potentially infectious material](#) such as, but **not** limited to, human cell lines and unfixed human tissue or organs shall be responsible for ensuring that:

- Procedures in CPR400.1.1.19/GN470086, [SNL Bloodborne Pathogens Exposure Control Plan](#), are implemented.

- Requirements of CPR400.1.1/MN471001, *ES&H Manual*, [Chapter 16](#), “Benefits and Health Services” (see “Bloodborne Pathogens”) are implemented.



Biological Toxins

Requirements

Managers of **MOW** who engage in work involving [biological toxins](#) shall be responsible for ensuring that:

- The requirements of CPR400.1.1/MN471001, *ES&H Manual*, [Section 6E](#), “Laboratory Standard – Chemical Hygiene Plan,” are implemented.
- Contaminated and potentially contaminated protective clothing and equipment shall be decontaminated using methods known to be effective against the toxin before removal from the laboratory for disposal, cleaning or repair. Materials contaminated with infectious agents as well as toxins shall also be autoclaved or otherwise rendered non-infectious before leaving the laboratory.



Immunoprophylaxis

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving biological agents shall be responsible for ensuring that access to the SNL Occupational Medical Surveillance and the Immunization Program is made available to those individuals.

Guidance

Consult the Health Services, Medical Clinic (3333) at SNL/NM or the Benefits and Health Services (8527/Marta Leon) at SNL/CA for additional information.



Security and Emergency Response

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving biological agents, select agents, or biological toxins shall be responsible for ensuring that security

plans and emergency response plans are developed and implemented for:

- Biological agents or biological toxins capable of causing serious or fatal illness to humans or animals, typically those requiring BSL-3 and BSL-4.

Note: BSL-3 and BSL-4 work falls outside the SNL's current Authorization Basis.



- All select agents.

Guidance

See CPR400.1.1/MN471001, [Chapter 15](#), “Emergency Preparedness and Management,” for additional information on emergency response and to the Security & Safeguards Direct Access List for [Security Plan Contact](#).

National Environmental Policy Act (NEPA)

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving [microorganisms](#) or [biological toxins](#) shall be responsible for ensuring that the necessary reviews, under the National Environmental Policy Act, have been performed. Refer to the requirements of CPR400.1.1/MN471001, *ES&H Manual*, [Section 10B](#), “National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties.”

Termination of Use

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving the disposal of microorganisms, biological toxins and associated contaminated materials, (except Health Services Center personnel who follow CPR400.1.1.19/GN470086, [SNL Bloodborne Pathogens Exposure Control Plan](#) for disposal of infectious waste) shall be responsible for ensuring that:

- All cultures, stocks, and other potentially contaminated materials are decontaminated or rendered noninfectious before disposal by a decontamination



method, such as [autoclaving](#) or an equivalent method that is approved by the [Biological Safety Officer](#).

Examples include:

- Culture and stocks of [microorganism](#) agents
 - Culture dishes and related devices
 - Contaminated solid items such as paper towels, cloth and plastic pipette tips, pipettes, vials, petri dishes, and gloves
 - Discarded live and attenuated vaccines
 - Human blood
 - [Other potentially infectious material](#)
- Materials are autoclaved within the same building in which they were used **or** generated.
 - Materials to be autoclaved outside the immediate laboratory are placed in a durable, leak-proof container that is closed for transport from one laboratory to another within the building.
 - Compactors, grinders, or similar devices are **not** used to reduce the volume of materials.
 - All material rendered as non-infectious waste, that is, solid waste, is disposed of when the material is **not** otherwise regulated, for example, hazardous or radioactive material.
 - The following sections of CPR400.1.1/MN471001, *ES&H Manual*, are consulted, as appropriate:
 - [Section 19A](#), “Hazardous Waste Management,” for additional information on waste disposal, including absorption of limited free liquids and disposal of regulated chemicals in the waste.

- [Section 10H](#), “Discharges to the Sanitary Sewer System,” for requirements regarding discharge of liquids to laboratory drains that connects to [publicly owned treatment works \(POTW\)](#).
- [Section 19F](#), “Other Wastes,” for requirements related to the disposal of infectious waste.
- [Section 19B](#), “Radioactive Waste Management,” for information on radioactive waste.



Autoclaves

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving microorganisms and biological toxins shall be responsible for ensuring that autoclaves used for sterilization, decontamination, or neutralization of infectious cultures, stocks, toxins, and other materials prior to disposal, are operated in accordance with operating procedures (Technical Work Documents) that contain the following requirements:



- Manufacturer specifications for operation of the autoclave are followed.
- Items are autoclaved in impact and tear-resistant orange/red autoclave bags with a sterilization indicator (e.g., the word “autoclaved”) capable of indicating that a temperature of at least 250 degrees Fahrenheit was reached.
- Temperature, moisture, pressure and time are adequate to achieve sterilization as demonstrated by killing *Bacillus stearothermophilus* spores or inducing a complete color change in an autoclave sterilization integrator (e.g., indicator bag or tape when either indicator is located in the center of the load).

Note: Sterilization time may vary with the quantity and density of items in the autoclave vessel.



- A biological monitor, such as *Bacillus stearothermophilus* spores, is used, which directly measures spore, bacteria, and other pathogen kills, at a minimum of once a month or at least once for each 40-hours of operation.
- Materials shall **not** be considered sterilized, decontaminated, or neutralized if an

indicator fails to indicate that a temperature of at least 250 degrees Fahrenheit was reached during the processing.

- Documentation of date; time; load number for each load; amount per load; duration of cycle; and operator's name is maintained in a logbook or file along with records of maintenance and repair for the autoclave.
- Documentation is made available for inspection upon request.
- Secondary containment, lids, and rigid holders are used to stabilize biohazard autoclave bags when there is a potential for leaks or hazardous aerosols.
- Securely closed and cooled, treated autoclave bags are placed in an impact and tear-resistant secondary clear bag, and the secondary bag is closed prior to disposal as solid waste.
- Autoclave operators certify in writing infectious materials have been rendered noninfectious by providing a completed [Attachment 6N-1](#), "Notification of Rendered Noninfectious Material" form, to the [Solid Waste](#) contact for each autoclave used to render infectious material noninfectious, and maintain documentation and supporting records for the notification.
- Autoclave operators certify in writing that they understand the operating procedures for the autoclave being used, including time, temperature, pressure, type of waste, type of container(s), closure of container(s), pattern of loading, water content, and maximum load quantity by signing as an authorized user of the appropriate autoclave operating procedure.

*SELECT AGENTS

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in or plan to engage in work involving [select agents](#) shall be responsible for ensuring the following requirements are applied, in addition to the applicable portions of the requirements specified for [microorganisms](#) and [biological toxins](#) (see "[Microorganisms and Toxins](#)").




Registration of Facilities

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving select agents shall be responsible for ensuring that:

- Proposed laboratories [and/or](#) facilities are registered with:
 - The [Centers for Disease Control and Prevention \(CDC\)](#) or with [United States Department of Agriculture - Animal and Plant Health Inspection Services \(USDA/APHIS\)](#) as being equipped and capable of handling the specific select agent at the appropriate biosafety level.
 - NNSA, as appropriate, through the [Responsible Facility Official \(RFO\)](#).



Managers shall work with the RFO to ensure that all requirements for registration with the CDC are met.


Note: The [RFO](#) shall be the primary point of contact with the CDC when seeking CDC registration or amending an existing CDC registration.

The RFO shall submit a copy of the registration documents to NNSA/AL.

Transferring and Requesting Select Agents

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving select agents shall be responsible for ensuring that:

- 
- Prior to transferring or receiving a select agent, the [Responsible Facility Official \(RFO\)](#) is informed of the intended transfer or receipt.
 - The principal investigator for the affected SNL laboratory or facility consults the RFO regarding sending and receiving the necessary CDC EA-101 form to and from the other laboratory/facility, the Centers for Disease Control and Prevention, and DOE.

Termination of Use/Destruction or Depletion of a Select Agent

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving select agents shall be responsible for ensuring that upon termination of the use of a select agent:

- All cultures and stocks of the select agent are handled in one of the following ways:
 - Securely stored in accordance with prudent laboratory practices.
 - Transferred to another registered facility in accordance with [42 CFR 72](#), *Interstate Shipment of Etiologic Agents*.
 - Destroyed on site by autoclaving or another recognized sterilization or neutralization process.
- The SNL [Responsible Facility Official \(RFO\)](#) is provided with a completed CDC EA-101 Form (blocks 1 through 5) noting disposition of a select agent within 5 business days of depletion of supply or destruction of the select agents.

Centers for Disease Control and Prevention (CDC) Corrective Actions and NNSA Safety Review Actions

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving select agents shall be responsible for ensuring that any corrective actions generated during an inspection by the CDC of facilities that are registered or are seeking registration to handle, transfer, use, or receive [select agents](#) are tracked and resolved prior to transfer or receipt of select agents.

The [Responsible Facility Official \(RFO\)](#) shall be responsible for:

- Ensuring that corrective actions are tracked and resolved.

- Assisting in remedying corrective actions as required by NNSA during a safety review.
-

*RECOMBINANT DNA MOLECULES

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in or plan to engage in work involving [recombinant DNA molecules](#) shall be responsible for ensuring the following requirements are applied, in addition to the applicable portions of the requirements specified for [microorganisms](#) and [biological toxins](#) above (see “Microorganisms and Toxins”):

- All proposed work with recombinant DNA molecules funded by the National Institutes of Health is submitted to the [Biological Safety Officer \(BSO\)](#) for a determination of whether the *National Institute of Health NIH Guidelines for Research Involving Recombinant DNA Molecules* are applicable, and if applicable, for review by an [Institutional Biosafety Committee](#).

Note: If work with recombinant DNA molecules is exempt from the NIH Guidelines and the work does not involve BSL-2 organisms, the BSO will review or delegate to Division IH for review.

- Applicable portions of the *National Institutes of Health NIH Guidelines for Research Involving [Recombinant DNA Molecules](#)* are implemented.

Guidance

Members of the Workforce shall contact the appropriate [Division ES&H Team](#) for guidance when working with recombinant DNA molecules.

*PLANT AND ANIMAL PATHOGENS; PLANT

PESTS AND NOXIOUS WEEDS

Restricted Animal Pathogens

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in work involving [plant and animal pathogens](#), plant pests, and noxious weeds shall be responsible for ensuring that the following requirements are implemented:

- U. S. Department of Agriculture (USDA) regulations or administrative policies, and any other applicable local, state, or federal laws and regulations. Consult the [Biological Safety Officer](#) for assistance.

Note: The importation, possession, and use of restricted animal pathogens is prohibited or restricted as specified by law, or by USDA regulations or administrative policies.

- Applicable portions of other topics within this document (e.g., "[Microorganisms and Biological Toxins](#)" and "[Select Agents](#)."

Import of Plant and Animal Pathogens

Requirements

Managers of [Members of the Workforce \(MOW\)](#) who engage in or plan to engage in the import of [plant or animal pathogens](#) shall ensure that a U.S. Department of Agriculture (USDA) [Animal and Plant Health Inspection Service \(APHIS\)](#) import permit is obtained when importing any infectious agents of animals or plants that are listed by USDA/APHIS as restricted pathogens, or other biological materials requiring permits.

Note: See Centers for Disease Control and Prevention Publication No. 93-8395, [Biosafety in Microbiological and Biomedical Laboratories](#), Appendix D, "Restricted Animal Pathogens," and the [APHIS website](#) requirements and a list of the restricted animal pathogens.

Note:

- An import permit may be required to import any other infectious agent of livestock or poultry.
- An import permit may also be required to import any livestock or poultry animal product such as blood, serum, or other tissues.
- Non-indigenous pathogens of domestic livestock and poultry may require special laboratory design, operation, and containment features **not** addressed in Centers for Disease Control and Prevention [Publication No. 93-8395, *Biosafety in Microbiological and Biomedical Laboratories*](#).
- Importation, possession, or use of restricted animal pathogens is prohibited or restricted by law, or by USDA regulations or administrative policies.

Members of the Workforce **shall** contact the appropriate **IH on their** [Division ES&H Team](#) for guidance when working with plant or animal pathogens.

HANTAVIRUS

Guidance

Note to [Members of the Workforce \(MOW\)](#) at SNL/NM: Because we live in the southwest, concerns about Hantavirus and the associated Hantavirus Pulmonary Syndrome (HPS) are high. However, per the Infectious Diseases and Inflammation Program (IDIP) at the University of New Mexico School of Medicine, the question of Hantavirus in Albuquerque is a question of numbers. Albuquerque has 1/3 of the state's population, yet has never had a reported case of HPS. Additionally, none of the Albuquerque area house mice or white-footed deer mice that have been caught and tested has had a positive test for HPS. Some house mice have been found to have the antibodies against HPS, indicating an exposure to the disease, but none have been found to be carriers of the disease itself. The IDIP receives thousands of phone calls from the Albuquerque area from people who have been exposed to rodents or rodent droppings. Of these, none of the callers has ever been found to contract HPS.

MOW may clean up rodent droppings, dead rodents, and nesting materials as long as the proper precautions against exposure to droppings are taken. The Centers for

Disease Control and Prevention safety precautions include the following:

- Do **not** stir up dust by sweeping or vacuuming.
- Wearing latex gloves, thoroughly wet rodent debris with a household detergent, liquid all-purpose disinfectant or a 1 part household bleach to 10 part water solution. This will disinfect the material.
- Once everything is wet, take up materials with a damp towel, then mop or sponge the area with disinfectant.
- Spray any dead rodents with disinfectant, and then double-bag in clear plastic bags along with all cleaning materials. Be sure to securely close bags (e.g., tape, tie in a knot, or use plastic ties) and then dispose of the bags in the trash.
- Disinfect gloves with disinfectant or soap and water before taking them off with disinfectant or soap and water.
- After taking off the clean gloves, thoroughly wash hands with soap and warm water.
- Dispose of disinfected gloves in the trash.

If droppings are found outside and have been subjected to sunlight, the UV from the sun would have quickly killed any Hantavirus.

In SNL/NM, [Telecon Plus](#), 844-4571, may be contacted to clean-up rodent debris. In SNL/CA, call the ES&H Hotline (4-3724) for additional guidance.

Members of the Workforce should contact their [Division ES&H Team](#) for additional guidance on feral animals and pest control.

*RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference

Bloodborne pathogens	Chapter 16 , "Health, Benefits, and Employee Services " (see " Bloodborne Pathogens ")
Emergency response	Chapter 15 , "Emergency Preparedness and Management"
Hazardous chemicals	Section 6D , "Hazard Communication Standard", Section 6E , "Laboratory Standard -Chemical Hygiene Plan"
Human studies	Chapter 16 , "Health, Benefits, and Employee Services" see "Protection of Human Research Subjects")
Immunization Program at SNL	Chapter 16 , "Health, Benefits, and Employee Services"
Inventory of microorganisms/biological toxins	Chemical Information System (CIS) . (Refer to "See Inventory procedure forms, and other documents")
NEPA	Section 10B , "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties"
Packaging and transportation of biological materials	Chapter 12 , "Packaging and Transportation of Hazardous Material"
Protected species	Section 10C , "Migratory Birds, Protected Species, and Other Biota "
Technical Work Documents (TWDs)	Chapter 21 , "Technical Work Documents (TWDs)"
Biological toxins	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Infectious waste	Section 19F , "Other Waste."



*REFERENCES

Requirements Source Documents

[9 CFR](#), *Animals and Animal Products*.

[7 CFR](#), *Agriculture*.

[29 CFR 1910.1030](#), *Occupational Exposures to Bloodborne Pathogens*.

[29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories*.

[40 CFR 171](#), *Certification of Pesticide Applicators*.

[42 CFR 72](#), *Interstate Shipment of Etiologic Agents*.

[42 CFR Parts 72 and 73](#), *Possession, Use, and Transfer of Select Agents and Toxins*.

[7 CFR Part 331 and 9 CFR Part 121](#), *Possession, Use, and Transfer of Biological Agents and Toxins*.

[DOE 450.7](#), *The Safe Handling, Transfer, and Receipt of Biological Etiological Agents at Department of Energy Facilities*

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

20 NMAC 9.1, New Mexico Solid Waste Management Regulations, New Mexico Administrative Code, State of New Mexico Environment Department (NMED)

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

Health and Human Services, U. S. Department of, Centers for Disease Control and

Prevention, Publication No. 93-8395, [Biosafety in Microbiological and Biomedical Laboratories](#).

National Institutes of Health, [NIH Guidelines for Research Involving Recombinant DNA Molecules](#).

World Health Organization, [Guidelines for the Safe Transport of Infectious Substances and Diagnostic Specimens](#).

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ES&H Manual

*SECTION 4L – PERSONAL PROTECTIVE EQUIPMENT (PPE)

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MN471001, Issue K

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Review: September 19, 2003

*Indicates a substantive change



- [Applicability](#)
 - [Training](#)
 - [*General Requirements](#)
 - [Eye and Face Protection](#)
 - [Prescription Safety Glasses](#)
 - [Protective Footwear](#)
 - [Head Protection](#)
 - [*Hand Protection](#)
 - [*Protective Clothing](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [4L-1](#) - Eye and Face Protection Recommendations
 - Forms
 - SF 2001-PEC, Personal Protective Equipment Checklist ([Word file](#)/[Acrobat file](#))
-



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to activities at [Sandia-controlled premises](#).

TRAINING

Managers shall ensure that:

- Members of the Workforce who use [personal protective equipment \(PPE\)](#) receive the appropriate training and retraining. This training shall, at a minimum, include the following topics:
 - Recognition of hazards that necessitate PPE
 - When PPE is necessary
 - What PPE is necessary
 - The limitations of PPE
 - How to properly don, doff, adjust, inspect, and wear PPE
 - The proper care, maintenance, useful life, and disposal of PPE

Note: For respirator training, see [Section 6C](#), "Respiratory Protection."

- Members of the Workforce demonstrate an understanding of the training and an ability to use PPE before being allowed to perform work requiring the use of PPE.
- Retraining in the use of PPE is provided to Members of the Workforce under **any**

of the following circumstances:

- Changes in the workplace that render previous training obsolete
- Changes in the types of PPE that render previous training obsolete
- Inadequacies in a worker's knowledge or use of assigned PPE that indicate that the worker has not retained the requisite understanding or skill
- PPE training that is not already recorded in the TEDS database is documented. Documentation shall include a description of the training, the name of the trained or retrained worker, and the date of training.

Members of the Workforce shall complete the following training requirements, as applicable, for routine use of PPE (e.g., gloves, eye and face protection, coveralls, safety shoes, and footcovers). Such training shall meet the PPE training requirements for these activities when the PPE used is typical of the work activity or role. For example, gloves, safety glasses, face shields, and goggles in a laboratory.

Work Activity or Role	Required	Recommended
Any site-specific activity involving the use of PPE and potential exposure to hazardous chemicals under normal operating conditions or in foreseeable emergencies in a Hazard Communication Standard workspace (see Section 6D , "Hazard Communication").	HAZ103	N/A
All laboratory workers engaging in the laboratory use of hazardous chemicals and using PPE under normal operating conditions or in foreseeable emergencies (see Section 6E , "Laboratory Standard - Chemical Hygiene Plan").	LAB100 or HAZ1011^a	N/A

<p>All Members of the Workforce who have access to high radiation and very high radiation areas; unescorted access to contamination areas; access to high contamination areas; or access to airborne radioactivity areas. (See CPR400.1.1.32, <i>Radiological Protection Procedures Manual</i>, Chapter 3, "Radiological Training Program")</p>	<p>RAD230</p>	<p>N/A</p>
<p>Members of the Workforce whose job duties involve the potential for occupational exposure to blood and other potentially contaminated materials including, but not limited to, human cell lines and unfixed human tissue or organs. (See Chapter 16, "Benefits and Health Services.")</p>	<p>MED113</p>	<p>N/A</p>
<p>Hazardous waste clean up operation supervised, general site workers ^b. (See Section 6K, "Hazardous Waste Operations and Emergency Response [HAZWOPER].")</p>	<p>ENV100^c</p>	<p>N/A</p>
<p>Supervised occasional workers ^d and work conducted in treatment, storage, and disposal (TSD) facilities that expose workers to health hazards or hazardous substances. (See Section 6K, "Hazardous Waste Operations and Emergency Response [HAZWOPER].")</p>	<p>ENV102^c</p>	<p>N/A</p>
<p>Emergency response operations hazardous material technicians ^e. (See Section 6K, "Hazardous Waste Operations and Emergency Response [HAZWOPER].")</p>	<p>EMG103^c</p>	<p>N/A</p>

- a** HAZ1011 may be used to meet the requirement if previously taken.
- b** "General site workers" are persons who are engaged in hazardous substance removal (cleanup operation) or other activities which expose or potentially expose workers to hazardous substances and health hazards during cleanup operations.
- c** Any vendor whose course complies with requirements in 29 CFR 1910.120 (a) through (q) and who provides documentation stating that fact is considered a valid vendor.
- d** "Occasional workers" are persons regularly on site at a hazardous waste site who work in areas which have been monitored and fully characterized indicating that exposures are under permissible and published exposure limits [where respirators are unnecessary], there are no existing health hazards, and there is no possibility for the development of an emergency.
- e** "Hazardous material technicians" are individuals who respond to hazardous substance releases or potential releases for the purpose of stopping the release. These individuals assume an aggressive role and approach the point of release in order to stop the release of a hazardous substance.

Guidance


Members of the Workforce may contact their [Division ES&H Team](#) for assistance with PPE training.

*GENERAL REQUIREMENTS

*Requirements


Managers shall ensure that:

- Protective equipment (including [personal protective equipment \[PPE\]](#) for the eyes,




face, head, and extremities; protective clothing; respiratory devices; and protective shields and barriers) is provided and used wherever absorption, inhalation, or physical contact with the following may cause injury or impairment:

- Process or environmental hazards
- Chemical hazards
- Radiological hazards
- Mechanical irritants (e.g., dust)
- Electrical hazards
- PPE is maintained in a sanitary and reliable condition.

- 
- A [workplace assessment](#) is performed through a written certification to determine if hazards are present, or likely to be present, that necessitate the use of PPE. **The division ES&H Team shall be contacted for guidance during this process.**

Note: Any [Technical Work Document](#) in which hazards and corresponding personal protective equipment (PPE) are identified and called out, may serve as documentation of a workplace hazard assessment. Examples of such TWDs include the following documents; Health and Safety Plans (HASPs), Job Hazard Assessments, Radiological Work Procedures (RWPs), Biosafety Manual, Confined Space Permits, e-TWDs, and Bloodborne Pathogens Exposure Control Plans.

Note: The OSHA Non-Mandatory Compliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection, [29 CFR 1910 Subpart I, Appendix B](#), contains an example of procedures that would comply with the requirement for a hazard assessment.

- 
- The assessment information is stored as an electronic or a hard copy document and shall contain, at least, the following information:
 - Identity of the workplace that was assessed
 - Identity of person certifying that the assessment has been performed
 - Date(s) the assessment was performed

- Statement identifying the document as a certification of hazard assessment
- If such hazards that necessitate the use of PPE are present or are likely to be present, managers shall ensure that:



- Members of the Workforce can recognize the hazards.
- Appropriate specific PPE (e.g., butyl rubber gloves, latex gloves, or nitrile gloves) is selected to protect workers from identified hazards.
- PPE selections are communicated to affected Members of the Workforce.
- Affected Members of the Workforce are properly fitted and trained on how to use the selected PPE.
- Affected Members of the Workforce use the selected PPE as directed.

Note: For requirements regarding respirators, see, [Section 6C](#), "Respiratory Protection."

Members of the Workforce who use PPE shall:



- Contact their [Division ES&H Team](#) if they do not understand how to properly use PPE.
- Notify their manager **before** performing work that requires using the equipment if they have reason to believe they do not understand how to properly use PPE.
- Wear selected PPE in accordance with training during all operations in which they are exposed to the corresponding identified hazard.
- Notify their manager if they are potentially exposed to a hazard that has not been previously assessed for applicability of PPE.

Guidance



Members of the Workforce should:

- Ensure that the PPE selected is as specific as possible given the hazard, such as “nitrile glove”, rather than “impervious glove”, “appropriate glove”, or “per the MSDS”.
- Ensure that PPE is evaluated for the potential to increase heat stress and take appropriate measures, including training, to mitigate the effects of potentially harmful heat stress.
- Consult with their [Division ES&H Team](#) if heat stress may be a factor in determining appropriate PPE.
- Post a notice (e.g., a SWHAS sign) identifying any PPE that is required before entry into an area (see MN471001, *ES&H Manual*, [Section 4M](#)).
- Ensure the selection of PPE is documented in a [technical work document](#) (see MN471001, *ES&H Manual*, [Chapter 21](#), "Technical Work Documents (TWDs)" and [GN470098](#), *Developing ES&H Procedures*).



Members of the Workforce should:

- Consider the following when determining the need for PPE:
 - The types of hazards and whether engineering controls can be used to mitigate the hazards, thus eliminating or minimizing the need for PPE.
 - PPE does not provide unlimited protection and is not a substitute for machine guards, local exhaust ventilation, or other engineering controls, and should not be relied upon to provide complete protection against hazards, but should be used in conjunction with engineering controls and safe work practices.
 - Where multiple and simultaneous exposure to a variety of hazards may occur, assessment of PPE should be coordinated with their [Division ES&H Team](#) to minimize introduction of additional hazards associated with PPE use.
 - PPE, except respirators, may be purchased through Just-In-Time (JIT) or other vendors (see [Section 6C](#), "Respiratory Protection," for information on obtaining respirators).





EYE AND FACE PROTECTION

Requirements

Managers shall ensure:


- Nonprescription safety glasses and goggles are available when activities or conditions present hazards that would be mitigated by their use.
- Eye protection also provides side protection when there is a hazard from flying objects, such as chemical splashes and particles
- Detachable side protectors (e.g., clip-on or slide-on side shields) comply with ANSI Z87.1-1989 standard, as stated in product descriptions or stamped on individual devices. Side protectors may be obtained from the [prescription safety glasses](#) contact.
- [Eye and face protection devices](#) (e.g., safety glasses) comply with ANSI Z87.1-1989 standard, as stated in product descriptions or stamped on individual devices.

Members of the Workforce shall:

- Use appropriate eye or face protection devices when exposed to eye or face hazards from:
 - Flying particles.
 - Molten metals.
 - Liquid chemicals.
 - Acidic or caustic liquids.
 - Potentially injurious light radiation (e.g., laser light, arc welding, arc cutting and brazing, and torch soldering). (See [Section 4E](#), "Hot Work Safety" for protection against injurious light radiation.)



- Chemical gases or vapors.
- Cryogenic materials.
- Electrical sources.
- Biohazardous materials.




- Members of the Workforce who wear prescription lenses (i.e., glasses, not contact lenses) while engaged in operations that involve eye hazards shall wear eye protection that does one of the following:

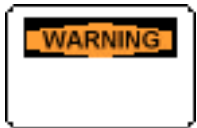
- Incorporates the prescription in its design (e.g., prescription safety glasses).
- Fits over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Guidance

Members of the Workforce should consult the relevant [material safety data sheet \(MSDS\)](#), their [Division ES&H Team](#), or [Attachment 4L-1](#) to select the appropriate eye and face protective devices.



Space ES&H owners (see [Section 1D](#), "Who Does What") should provide appropriate eye protective devices for visitors in areas that require eye protection.



Wearing metal-frame protective eye devices in areas where electrical hazards are present may increase the risk of electrical shock.

PRESCRIPTION SAFETY GLASSES

Requirements

Managers shall ensure that prescription safety glasses meet the requirements of ANSI Z87.1, 1989.

Guidance

Managers may recommend prescription safety glasses for Members of the Workforce needing vision correction when alternatives, such as goggles over corrective glasses, are not sufficient. To obtain SNL-funded prescription safety glasses:

- SNL employees at SNL/NM, SNL/CA, and KTF should consult with their manager and get approval before obtaining prescription safety glasses from the [prescription safety glasses](#) contact.
- SNL employees at TTR should obtain prescription safety glasses by taking an authorization, available from the TTR office, to a local optician.

Contractors at SNL/NM may, with a manager's authorization, use the [prescription safety glasses](#) contact.

Note: All other contractors are responsible for providing their own prescription safety glasses.

PROTECTIVE FOOTWEAR

Requirements

Managers shall ensure that safety shoes meet the requirements of ANSI Z41-1991 and are marked with ANSI Z41-1991.

Members of the Workforce shall use protective footwear (e.g., safety shoes) when working in areas where there is a danger of foot injuries due to falling or rolling objects, objects piercing the sole, or where feet are exposed to electrical hazards.


Note: Members of the Workforce may purchase electrical protective footwear if conductive or nonconductive soles are appropriate to perform the work.

Guidance

SNL/NM personnel should contact their [Division ES&H Team](#) for assistance in


determining the necessity for protective footwear.

SNL/NM employees are allowed:

- 
- To purchase up to two pairs of safety shoes, if needed and with their manager's approval, at SNL's expense and may spend up to \$140 per pair per year. For special requirement shoes, managers may approve expenditures for more than \$140.
 - Up to 2 hours of work time to purchase safety shoes.

SNL/NM may pay for contractors' safety shoes depending on the specific contract language. Otherwise contractors supply their own safety shoes.

At SNL/CA, the shoemobile makes periodic visits and the responsible organization processes payments for the shoes. However, SNL/CA employees may purchase shoes from other vendors and submit a reimbursement voucher. Special-duty shoes require approval of the responsible manager and a justification memo indicating the intended use for the shoes. Contractors at SNL/CA who purchase shoes from the shoemobile must ensure that their employers will reimburse the cost of the shoes before the purchase.




HEAD PROTECTION

Requirements

Managers shall ensure hard hats meet the requirements and specifications established in ANSI Z89.1-1986.

Members of the Workforce shall wear protective helmets (e.g., hard hats):

- 
- When working in areas where the potential exists for head injuries from falling objects.
 - Designed to reduce the level of electrical shock hazard when working near exposed electrical conductors that could contact the head.

Guidance

Members of the Workforce may contact their [Division ES&H Team](#) for assistance in determining the necessity for protective helmets.

*HAND PROTECTION


*Requirements

Managers shall ensure that hand protection is selected based on the following:

- Performance characteristics of the protection relative to the task(s) to be performed
- Present conditions
- Duration of use
- Identified and potential hazards

Members of the Workforce shall use hand protection (e.g., impervious gloves, insulated mittens) if their hands are exposed to hazards, such as those from:

- Skin absorption of harmful substances (see the definition of "[hazard, health](#)").
 - Severe abrasions, cuts, or lacerations.
 - Punctures.
 - Chemical burns (e.g., caustics, acids).
 - Thermal burns (e.g., ovens, furnaces).
 - Harmful temperature extremes (e.g., cryogenics).
 - Electrical energized parts.




Members of the Workforce shall consult the relevant [material safety data sheet \(MSDS\)](#), [SNL Chemical Information System \(CIS\)](#), and/or [Division ES&H Team](#) to select appropriate hand protection.

*PROTECTIVE CLOTHING

*Requirements

Members of the Workforce shall use the appropriate protective clothing when exposed to hazards, such as:

- 
- Extreme heat or cold.
 - Sharp objects.
 - Splashes of harmful substances (for example, caustics, acids, molten metal).
 - Skin irritants.
 - Environmental contamination (such as, chemical, radioactive). See MN471016, *Radiological Protection Procedures Manual*, [Chapter 1](#), "Radiological Work Planning and Controls," for use of [personal protective equipment \(PPE\)](#) with radioactive contamination.
 - Electrical arc blast.

Members of the Workforce shall consult the relevant [material safety data sheet \(MSDS\)](#) and/or their [Division ES&H Team](#) to select appropriate protective clothing.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to use of [personal protective equipment \(PPE\)](#) include:

Hazard/Activity	Reference
Respiratory protection for inhalation hazards	Section 6C , "Respiratory Protection"
PPE for lasers and intense light	Section 6G , "Lasers and Intense Light"
PPE for noise hazards	Section 6H , "Noise Exposure and Hearing Conservation"
PPE for radiological hazards	MN471016, <i>Radiological Protection Procedures Manual</i> , Chapter 1 , "Radiological Work Planning and Controls"
PPE for electrical hazards	Section 4B , "Electrical Safety Practices"
Additional criteria regarding PPE for cryogenics	MN471000, <i>Pressure Safety Manual</i> , Chapter 5 , "Selecting and Assembling Pressure Hardware"
Disposal of contaminated PPE	Chapter 19 , "Waste Management "
PPE for protection against bloodborne pathogens	GN470086 , <i>SNL Bloodborne Pathogens Exposure Control Plan</i>
PPE for welding and cutting	Section 4E , "Hot Work Safety"
Use of Sandia Workplace Hazards Awareness System (SWHAS) signs	MN41001, <i>ES&H Manual</i> , Section 4M , "Signs (Including SWHAS) and Tags"

REFERENCES

Requirements Source Documents

[29 CFR 1910.132](#), *General Requirements*.

[29 CFR 1910.133](#), *Eye and Face Protection*.

[29 CFR 1910.134](#), *Respiratory Protection*.

[29 CFR 1910.135](#), *Head Protection*.

[29 CFR 1910.136](#), *Foot Protection*.

[29 CFR 1910.138](#), *Hand Protection*.

[29 CFR 1910.1200](#), *Hazard Communication*.

[29 CFR 1910.1450](#), *Occupational Exposure to Hazardous Chemicals in Laboratories*.

Implementing Documents

SNL, [GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan*.

SNL, [GN470094](#), *Handling Chemicals at SNL/CA*.

SNL, [MN471000](#), *Pressure Safety Manual*.

SNL, [MN471001](#), *ES&H Manual*.

SNL, [MN471004](#), *Electrical Safety Manual*.

SNL, [MN471011](#), *Sandia Explosives Safety Manual*.

SNL, [MN471016](#), *Radiological Protection Procedures Manual*.

SNL, [MN471018](#), *Conduct of Operations Manual: Explosives Operations*.

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

[29 CFR 1926](#), *Safety and Health Regulations for Construction*.

ANSI Z41-1991, *Personal Protection - Protective Footwear*.

ANSI Z87.1-1989, *Practice for Occupational and Educational Eye and Face Protection*.

ANSI Z89.1-1986, *Protective Headwear for Industrial Workers*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

DOT, Transport Canada, and Secretariat of Communication and Transportation of Mexico, [North American Emergency Response Guidebook](#), 2000.

Forsberg, K., and S. Mansdorf, *Quick Reference Guide to Chemical Protective Clothing*.

NIOSH, [Pocket Guide to Chemical Hazards](#), 1997.



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ES&H Manual

***ATTACHMENT 6D-1 – MANUFACTURE, DISTRIBUTION, AND IMPORT OF HAZARDOUS CHEMICALS**

Subject Matter Expert: [Linda Stiles](#); CA Counterpart: [Al Buerer](#)

MN471001, Issue F

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Review Date: April 9, 2007

Administrative Changes: April 9, 2007, and [May 21, 2007](#)



***RESOURCES FOR HAZARD DETERMINATION**

Requirements

Managers of activities where chemicals are [manufactured](#), [distributed](#), or [imported](#) shall be responsible for verifying that such chemicals are evaluated to determine if they are hazardous by:

- Identifying and considering the available scientific evidence concerning such hazards when evaluating these chemicals.
- Consulting [Appendix A](#) of 29 CFR 1910.1200 for the scope of the [health hazard](#) considered.
- Consulting [Appendix B](#) of 29 CFR 1910.1200 for the criteria to be followed for completeness of the investigation and data to be reported.
- Consulting the following sources to establish whether a chemical is hazardous, or



whether a chemical is a [carcinogen](#) or potential carcinogen:

- [29 CFR 1910, Subpart Z](#), *Toxic and Hazardous Substances*.
- *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment*, American Conference of Governmental Industrial Hygienists (ACGIH).
- National Toxicology Program (NTP), [Annual Report on Carcinogens](#).
- International Agency for Research on Cancer (IARC), *Monographs*.



Managers shall be responsible for verifying that:

- The hazards of chemical mixtures are determined from the available scientific evidence using:
 - Information on the chemical as a whole if it has been tested as a whole.
 - Information on the components that comprise 1% (by weight or volume) or greater of the mixture if the mixture has not been tested as a whole to determine that the mixture is a [hazardous chemical](#).
 - Information on the carcinogenic components that comprise 0.1% or greater of the mixture if the mixture has not been tested as a whole to determine that the mixture is carcinogenic.
 - Available scientifically valid data to evaluate the [physical hazard](#) potential of the mixture.
- The procedures used to determine the hazards of a chemical are described in writing and made available upon request.



[Members of the Workforce](#) shall inform management and the [Industrial Hygienist supporting their](#) Division when a chemical will be used that has not been previously evaluated as a hazard.

Guidance




Managers should contact their [Division ES&H Team](#) for assistance in evaluating hazardous chemicals.

CONTAINER LABELS


Requirements

Managers of activities where chemicals are [manufactured](#), [distributed](#), or [imported](#) shall be responsible for verifying that each container of manufactured, distributed, or imported [hazardous chemical](#) is labeled, tagged, or marked with the following information:

- 
- Identity of the [hazardous chemicals](#) contained in the work area.
 - Appropriate hazard warnings.
 - Name and address of the chemical manufacturer, importer, or other responsible party.
-

*MSDSs FOR MANUFACTURED, DISTRIBUTED, OR IMPORTED HAZARDOUS CHEMICALS

Requirements



Managers of activities where chemicals are [manufactured](#), [distributed](#), or [imported](#) shall be responsible for obtaining or developing a [material safety data sheet](#) (MSDS) for each [hazardous chemical](#) they [manufacture](#), [import](#), [distribute](#) to an offsite user (excluding test samples unless required by the tester) or transfer to an onsite user.

If the composition of a chemical substance produced exclusively for SNL's use is known, and determined to be hazardous, the manager shall be responsible for verifying that Members of the Workforce are appropriately trained in handling that chemical.

If the composition of a chemical produced as a byproduct is unknown, Members of the

Workforce shall assume the substance is a [hazardous chemical](#) and implement appropriate requirements for work with [hazardous chemicals](#).

Guidance

[Members of the Workforce](#) who require an [SNL MSDS](#) to be developed for a hazardous chemical should complete an SNL MSDS Request Form (SF 2001-MSR) ([Word file/ Acrobat file](#)) and route it to their [Industrial Hygienist supporting their division](#).



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ES&H Manual

*SECTION 4S - USE OF POWERED CARTS

Subject Matter Expert: [Willie Johns](#); CA Counterpart: [Herman Armijo](#)

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* Indicates a substantive change



- [*Applicability](#)
- [*Responsibilities](#)
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- [Batteries and Charging Batteries](#)
- [*Gasoline and Refueling](#)
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 - [4S-1](#) - Driving the Cart
 - [4S-2](#) - Charging Batteries
 - [4S-3](#) - Refueling Gasoline Powered Carts



*APPLICABILITY

For purposes of this document, Members of the Workforce (MOWs) are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to the operation of gasoline and all battery [powered carts](#) on [Sandia-controlled premises](#).

*RESPONSIBILITIES

Requirements

- Managers shall ensure that direct reports adhere to the requirements in this ES&H Manual section.
- Members of the Workforce shall adhere to the requirements in this ES&H Manual section.

POWERED CART OPERATION

Requirements

Drivers shall:

- Possess a valid state driver's license.
- Use carts for official [Sandia](#) business only.
- Observe the operator's manual safety requirements and guidelines for the cart.
- Obtain approval from the [fleet services](#) contact before modifying a cart or installing accessories.



Drivers **shall not** drive carts:

- On snow or ice.
- In high winds, above 40 mph.
- After dark or before dawn unless equipped with tail lights and headlights that produce a safe level of illumination.

Guidance

Drivers should **review** [Attachment 4S-1](#) for operating safety precautions.

Members of the Workforce and visitors can use the [Quick Reference Traffic Guide for Sandia National Laboratories New Mexico](#) as a reference guide to traffic rules.

*AREAS OF OPERATION

Requirements

Sandia/NM drivers shall operate any type of cart (gasoline- or battery-powered) only in the following areas:

- Inside Technical Areas.
- Between Technical Areas I, II, and IV and Building 996, using 9th Street.
- The **Fleet Services** area, using Gate 8.
- Building 887, using Gate 8.
- Buildings 956, 957, 870, 858, 857A, and 897 and T-City using Gate 10 **and** the center driveway through the parking lot south of Building 825.
- On H Street between Gate 6 and 20th Street , but not on or across 20th Street.



- On H Street across Wyoming **Boulevard** to the Air Force Gas Station on 1st Street, but only during the hours 8:30 to 11:30 a.m. and 1:30 to 3:30 p.m., **Monday through Friday**.
- On K Street between 14 Street and 20th Street.
- To the Explosives Test Facility (Building 905), using the cart path located to the south of and parallel to Hardin **Boulevard**.
- The cart path between building 858 and the RMSL (**the Robotics Building**).

Sandia/NM drivers shall not drive carts to the 6000 Igloo Area, **off KAFB for any reason**, or on the following streets:

- Pennsylvania Avenue.
- Wyoming Boulevard, except to cross to **the** Air Force Gas Station.
- Powerline Road.
- Hardin Boulevard, except to cross it at either 9th or 20th Street.
- **Streets where the posted speed limit is greater than 25 MPH.**
- **Carts (such as EZ-GO, Club Carts, Mighty Mites, Tiger Trucks, and Cushman) can only be driven on streets where the posted speed limit is 25 MPH or less.**

Note: GEM carts travel at speeds of up to 25 MPH. By City of Albuquerque and New Mexico state law, these vehicles may only be used on roadways where the posted speed limit is 35 MPH or less. Since the speed limit on Eubank is 40 MPH, these carts are not allowed outside the Eubank Gate (see the GEM cart website: <http://www.gemcar.com/> for more information).

Sandia/CA drivers shall not drive on East Avenue **unless on official business**.

BATTERIES AND CHARGING BATTERIES

Requirements

Members of the Workforce shall only charge batteries in a well ventilated area. All **MOWs** shall avoid smoking and any activity that can produce sparks, flame, or electric arcs.

Guidance

See [Attachment 4S-2](#) for information regarding the operation of battery-[powered carts](#) and the procedure for charging batteries after each day's use.

*GASOLINE AND REFUELING

Requirements

Sandia/NM drivers shall refuel gasoline [powered carts](#) at the Air Force Gas Station at the intersection of 1st Street and H Street, **using black chip or the Sandia National Laboratories Fleet Services , fuel cards.**

Sandia/CA drivers shall refuel gasoline [powered carts](#) at Building 963.

Guidance

See [Attachment 4S-3](#) for refueling instructions.

*MAINTENANCE

Requirements

Sandia/NM cart-owning organizations shall promptly submit carts for preventive or corrective maintenance when requested to do so by notification from the [fleet services](#) contact. When submitting a cart to the [fleet services](#) contact, report all breakdowns,

changes in performance, faulty brakes, faulty steering, and faulty suspension so that they can be corrected.

Sandia/CA carts shall be maintained and repaired at Building 9623.

The [fleet services](#) contact shall approve all modifications to carts.

ACCIDENT REPORTING

Requirements

Drivers shall report all cart accidents involving injury or property damage. Accidents shall be investigated and reported in accordance with the instructions in [Section 18F](#), "Reporting Vehicle and Property Damage Accidents." For assistance in conducting an investigation, contact your ES&H Support Team.

Drivers shall report accidents involving an injury in accordance with the instructions in [Section 18D](#), "Reporting Occupational Injuries and Illnesses," and [Section 18C](#), "Reporting Occurrences."

Drivers shall respond to and report accidents, which result in a release of gasoline or oil to the environment (no matter how small a quantity), in accordance with the instructions in [Section 10F](#), "Oils, Greases, and Fuels."

Drivers shall respond to and report accidents, which cause the battery casing to rupture and possibly allow the battery's contents to be released to the environment, in accordance with the instructions in [Section 10E](#), "Chemical Spills", and [Section 18E](#), "Environmental Release Reporting."

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference

Reporting accidents	Section 18F , "Reporting Vehicle and Property Damage Accidents"
Traffic safety	Section 4K , "Traffic Safety"



REFERENCES

Requirements Source Documents

[29 CFR 1910.178](#), "Powered Industrial Trucks."

SNL/NM Traffic Safety Rules.

*Implementing Documents

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents



Cart Owners Operation and Maintenance Manuals.

MN471001, *ES&H Manual*:

- [Section 10E](#), "Chemical Spills."
- [Chapter 12](#), "Packaging and Transportation of Hazardous Materials."
- [Section 18D](#), "Reporting Occupational Injuries and Illnesses."
- [Section 18E](#), "Environmental Release Reporting."
- [Section 18F](#), "Reporting Vehicle and Property Damage Accidents."



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ES&H Manual

ATTACHMENT 4S-2 - CHARGING BATTERIES IN ELECTRIC-POWERED CARTS

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Charger Precautions

Members of the Workforce who use battery chargers should observe the following precautions:

- Locate the charger out of the sun.
- Locate the charger where it will be protected from any precipitation.
- Keep charger cords clear of water puddles and paths of travel.
- Have a battery acid cleanup kit nearby.

Warning: Do not plug a cart battery charger to the cart or to an AC receptacle while the charger is set in the "ON" position.



Charging After Use

Batteries on electric carts should be charged after each day's use following the procedure shown below.

Step	Action
1	Be sure that battery charger time or elapsed time indicator is in the "OFF" position.
2	Check cords and connections for damage; correct defects prior to use.
3	Plug AC cord into a grounded outlet.
4	Plug DC cord into the charger receptacle on cart. Check that the DC plug is fully inserted into the cart's receptacle. A loose connection may result in high temperatures that can damage the plug and receptacle or result in a fire hazard.
5	Turn battery charger knob to the start position.

Before driving an electric cart, disconnect the charger as shown below.

Step	Action
1	Turn battery charger control knob to "OFF" position before removing the cart from charge.
2	Disconnect DC cord if charger is not mounted on the cart. Store the DC cord so it will not be run over by the cart or cause a tripping hazard.
3	Store the charger in its appropriate place.



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ES&H Manual

ATTACHMENT 4S-3 - REFUELING GASOLINE POWERED CARTS

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Drivers should frequently check to ensure adequate fuel and oil levels of gasoline powered carts. E-Z-Go ® carts are powered by a two-cycle oil injected gasoline engine that requires both gasoline and oil. For carts that do not have a fuel gauge, establish a schedule to fill the gas and oil tanks after approximately 5 hours of use.

Note: When the operator's manual contains a procedure that is different from this attachment, follow the manufacturer's instructions.

Sandia/NM, refuel gasoline powered carts at the Air Force Gas Station at the intersection of 1st Street and H Street and Fleet Services (North of building 876) . Use the procedure shown below when refueling a cart.

Sandia/CA, refuel gasoline powered carts at Building 963.

Step	Action
1	Turn the key to "OFF" position and remove it from the switch.
2	Set the parking brake.
3	Raise the seat and check the fuel level. Use caution; engine and exhaust components get very hot and can cause severe burns.

4	Check oil level in the small plastic tank located under the seat. If oil level is low, add the type of oil appropriate for the type of cart. E-Z-Go ® carts use a special oil; Club ® Carts use regular motor oil. Both types of oil are available at service stations.
5	Add gasoline according to instructions on the fuel pump. Do not smoke during refueling.
6	After refueling, replace the fuel tank cap and clean any spilled fuel or oil. Dispose of rags used to wipe away spilled oil and gasoline into the appropriately marked metal safety container located near the pumps.



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SECTION 6S - TOXIC SUBSTANCES CONTROL ACT (TSCA)

Subject Matter Expert: [Katie Moore](#); CA Counterpart: [Daniel Kuey](#)

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- [Applicability](#)
- *[General Toxic Substances Control Act \(TSCA\) Compliance Topics](#)
- *[Toxic Substances Control Act \(TSCA\) Compliance With Topics 8C and 8E](#)
- *[Cooperative Research and Development Agreements \(CRADAs\) and Work for Others \(WFO\) Agreements](#)
- *[Toxic Substances Control Act \(TSCA\) Exports](#)
- *[Toxic Substances Control Act \(TSCA\) Imports](#)
- [Related Hazards and Activities](#)
- [References](#)
- Forms
 - SF 2001-NEC, Notice of Export for Chemical Substances form ([Word file](#)/[Acrobat file](#))



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all [Members of the Workforce](#) whose activities involve [chemical substances](#).

*GENERAL TOXIC SUBSTANCES CONTROL ACT (TSCA) COMPLIANCE TOPICS

Requirements

The [Toxic Substances Control Act \(TSCA\)](#), 15 USC Section 2601 et seq., gives the [Environmental Protection Agency \(EPA\)](#) comprehensive authority to regulate the manufacture, use, distribution in commerce, and disposal of chemical substances. Under the TSCA, the EPA is required to compile, keep current, and publish a TSCA inventory of chemical substances being manufactured, imported, and processed in the United States. This TSCA inventory is considered to be the list of [existing chemicals](#). If a chemical is **not** listed on the TSCA Inventory, it is considered to be a [new chemical](#) substance. Sandia consists of non-commercial facilities that do **not** manufacture or [process](#) chemical substances for [commercial purposes](#).

Citations provided correlate with the Title I sections of the Act for ease in transmitting the requirements. Accordingly, [Members of the Workforce \(MOW\)](#) shall comply with the following TSCA Sections:

- TSCA Sections 4, 6, 12, and 13.
- TSCA Sections 8C and 8E because it is consistent with good management and worker protection.

Note: Sandia is exempt from TSCA Section 5 and 8 except for Section 8C and 8E.

Note: TSCA Section 4 addresses testing requirements for specific chemicals. TSCA Section 6 applies to Polychlorinated Biphenyls (PCBs) and is **not** included in this section of the ES&H Manual. See [Section 10D, "Polychlorinated Biphenyl \(PCB\) Management."](#)

TSCA Section 8C addresses keeping records of significant adverse reactions to health and the environment allegedly caused by a chemical substance and TSCA Section 8E involves reporting to EPA if a pattern of health effects are observed for new chemical substances or if health effects which have **not** previously been identified for known chemicals are observed.

TSCA Section 12 requires Export notifications to inform foreign governments of shipments of chemical substances. TSCA Section 13 requires Import certification to ensure that all chemical substances imported into the United States comply with TSCA.

MOW may work with new chemical substances as part of research and development activities for non-commercial use. Because these new chemical substances have unknown toxicity, Managers of MOW handling new chemical substances shall do the following:

- Ensure that [Technical Work Documents \(TWDs\)](#) (e.g. SOPs) which include good laboratory practices and requirements for implementing the highest level of protection when handling new chemical substances are developed and followed.
- Inform MOW of the fact that health and environmental hazards are unknown for new chemical substances.
- Inform MOW to report to [Medical](#) or to the [TSCA subject matter expert \(SME\)](#) any significant adverse health effects believed to be caused from new chemical substances.
- Inform MOW to report to the Environmental Protection or to the TSCA subject matter expert any significant adverse environmental effect is believed to be caused by new [chemical substances](#).

Some new chemical substances may be regulated by the Toxic Substances Control Act (TSCA) for import and/or export. MOW shall provide information about these of chemical substances to the TSCA subject matter expert or the Import/Export Control Office when requested.

Guidance

[Members of the Workforce \(MOW\)](#) should contact the IH on the [Division ES&H Team](#) or the [TSCA contact](#) for guidance on working with TSCA-regulated substances.

*TOXIC SUBSTANCES CONTROL ACT (TSCA) COMPLIANCE WITH 8C AND 8E TOPICS

Requirements

[Members of the Workforce \(MOW\)](#) shall report to [Medical](#) if health effects occur and are associated with handling of chemicals as part of research and development activities for non-commercial use. Medical shall evaluate and classify the health effects from the potential chemical exposure and will indicate if the exposure is one of the following:

- Unknown health effects are associated with a known chemical.
- Unknown health effects are caused by a new chemical substance.

Health Services shall contact the [TSCA SME](#) if either is a diagnosis for inclusion in the TSCA 8C file. If a pattern of significant health effects is observed in the TSCA 8C file and assessed by the TSCA SME, then the TSCA SME shall notify the EPA if:

- The health effects are related to the new chemical substance.
- The health effects are unknown and are caused by a known chemical.

MOW shall provide information about the use of chemical substances to the [TSCA SME](#) or the [Import/Export Control Office](#) upon request.

Guidance

[Members of the Workforce \(MOW\)](#) should contact their [Division ES&H Team](#) Industrial Hygienist (IH) or the [TSCA SME](#) for guidance on working with TSCA-regulated substances.

*COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS (CRADAs) AND WORK FOR OTHERS (WFO) AGREEMENTS

Requirements

If work is conducted on a [Cooperative Research and Development Agreement \(CRADA\)](#), [Work for Others \(WFO\)](#) agreement, or other research agreement with non-SNL partners, in which new [chemical substances](#) are developed or a significant new use of an existing chemical substance is planned, the [Sandia Corporate Contracts & Policy Management Department](#) shall:

- Include in the prime contract, Part II - Contract Clauses - Section I, a statement that Sandia must not perform 'work for others' activities that would place it in direct competition with the domestic private sector.
- Work with the research partner(s) to identify and document [Toxic Substances Control Act \(TSCA\)](#) responsibilities in the written agreement or legal contract.
- Explain how TSCA liabilities are addressed through legal contracts.

Note: SNL typically does **not** receive commercial advantage for conducting research work therefore, TSCA compliance in such instances shall be the



responsibility of the non-SNL research partner.

Guidance

Chemical owners or [principal investigators](#) should contact the [Legal Infrastructure Support Center](#) and the [TSCA subject matter expert \(SME\)](#) for guidance when research will involve [commercial purposes](#).

*TOXIC SUBSTANCES CONTROL ACT (TSCA) EXPORTS

Requirements

Certain chemicals and mixtures identified in TSCA Section 12B require Export Notification to the [Environmental Protection Agency \(EPA\)](#).

SNL International and Domestic Security Contracts and the Import/Export Control Office are the lead contacts for TSCA import and export compliance. Chemical owners or [principal investigators](#) shall do the following when planning to [export](#) a [chemical substance](#) out of the [customs territory of the United States](#): Chemical owners or [principal investigators](#) shall do the following when planning to [export](#) a [chemical substance](#) out of the [customs territory of the United States](#):

- Complete a Notice of Export for Chemical Substances form (SF 2001-NEC [[Word file/Acrobat file](#)]) and forward the completed form to the [TSCA contact](#) at least seven days prior to intended export.
- Call the [Import/Export Control Office](#) in Department 10245 if there are any questions.

*TOXIC SUBSTANCES CONTROL ACT (TSCA)

IMPORTS

Requirements

Members of the Workforce (MOW) who import a chemical substance shall comply with Toxic Substances Control Act (TSCA) Section 13 and certify the status of all imported chemicals. The certification shall be expressed as a negative or positive statement as follows:

- **Negative Certification.** Importers of chemicals **not** subject to TSCA must certify that compliance with TSCA is **not** required. Importers must certify this by signing the following negative certification statement:

- “I certify that all chemicals in this shipment are **not** subject to TSCA.”

- **Positive Certification.** Importers of chemicals subject to TSCA must certify that compliance with TSCA has been determined. Importers must certify this by signing the following positive certification statement:

- “I certify that all chemicals in this shipment comply with all applicable rules or orders under TSCA and that I am **not** offering a chemical substance for entry in violation of TSCA or any applicable rule or order under TSCA.”

Note: Chemicals shall **not** be purchased on P-Cards. See [CPR 500.2.1](#), *Procurement Manual*.

Sandia International and Domestic Security Contracts and the [Import/Export Control Office](#) are the primary contacts for TSCA import compliance. Chemical owners or [principal investigators](#) who plan to import a chemical substance into the customs territory of the United States without using JIT shall purchase the imported chemical substance through the appropriate SNL International buyer.

As arranged by the International buyer, SNL can either act as the Importer of Record or use a Custom Broker:

- If SNL is the Importer of Record, then the SNL Buyer shall obtain the TSCA

certification statement from the sender.

- If SNL uses a Custom Broker, then the Custom Broker shall obtain the TSCA certification from the sender.
- If no TSCA certification is available with the shipping documentation, then the Sandia Buyer or the Custom Broker shall contact the sender to obtain the TSCA certification and provide a copy of that TSCA certification to the Import/Export Control Office.
- The sender is responsible for providing the proper TSCA certification.

If certification is **not** able to be obtained from these sources, then the Import/Export Control Office shall ask the [TSCA subject matter expert \(SME\)](#) to determine the TSCA requirements for the chemical substance or return the chemical to the sender.

Guidance

Chemical purchases should be made through Just-In-Time (JIT) if possible. The JIT vendor is responsible for filing the necessary TSCA paper work on the behalf of SNL.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to the Toxic Substances Control Act (TSCA) include:

Hazard/Activity	Reference
Chemical waste	Section 19A , "Hazardous Waste Management"
Chemical inventories	Section 6D , "Hazard Communication Standard"
Control of hazardous chemicals	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Handling chemicals at SNL/CA	GN470094 , <i>Handling Chemicals at SNL/CA</i>

Hazard communication	Section 6D , "Hazard Communication Standard"
Polychlorinated biphenyls (PCBs)	Section 10D , "Polychlorinated Biphenyl (PCB) Management"
Purchasing chemicals at SNL	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan" GN470094 , <i>Handling Chemicals at SNL/CA</i>

REFERENCES

Requirements Source Documents

40 CFR, Subchapter R, *Toxic Substances Control Act*.

15 USC, Section 2601 *et seq.*

Implementing Documents

SNL, [PG470019](#), *Industrial Hygiene Program Overview*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

19 CFR 101.1, *General Provisions*, "Definitions."

7 USC 136, *et seq.*, *Federal Insecticide, Fungicide, and Rodenticide Act*.

21 USC 801 *et seq.*, *Federal Food, Drug, and Cosmetic Act*, as amended.

42 USC 2011 *et seq.*, *Atomic Energy Act of 1954 (AEA)*, as amended.



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ES&H Manual

SECTION 6C – RESPIRATORY PROTECTION

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* Indicates a substantive change

- [Applicability](#)
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- [Respiratory Protection Process](#)
- [*Medical Review and Approval](#)
- [Respirator Authorization Cards](#)
- [Issuance of Respirators](#)
- [*Respirator Use](#)
- [Prescription Eyewear](#)
- [Respirator Facepiece to Face Seal](#)
- [*Cleaning and Disposal](#)
- [Repair and Maintenance](#)
- [Storage](#)
- [*Filtering Facepieces \(Dust Masks\)](#)
- [Withdrawal From the Respiratory Protection Program](#)
- [*Related Hazards and Activities](#)
- [References](#)



- Attachments
 - 6C-1 - Respiratory Protection Process Flowchart ([Word file/Acrobat file](#))
 - [*6C-2](#) - Sample Respirator Authorization Cards
 - [*6C-3](#) - Information for Employees Using Respirators When Not Required Under the Standard [29 CFR 1910.134, Appendix D]
- Forms
 - SF 2001-HAE, Hazard Analysis: Emergency and Rescue Use of Respiratory Protection ([Word file/Acrobat file](#))
 - SF 2001-MCR, Sandia National Laboratories/New Mexico Respiratory Protection Selection & Medical Evaluation ([Word file/Acrobat file](#))
 - SF 2001-MCS, Sandia National Laboratories/California Respiratory Protection Selection & Medical Evaluation ([Word file/Acrobat file](#))
 - SF 2001-WN, Withdrawal From the Respiratory Protection Program ([Word file/Acrobat file](#))



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to all activities that involve respiratory protection at all [Sandia-controlled premises](#). Contractor personnel, other than those included as Members of the Workforce, shall be responsible for obtaining medical review, training, worksite evaluation, and respirators from their parent employer.

*TRAINING AND FIT TESTING

Work Activity or Role	Site	Required	Recommended



Use of air-supplied, or air-supplied and air-purifying respirators (includes emergency response personnel, hazardous material [HAZMAT] team members, and personnel whose job requirements specify use of these respirators).	All sites	RSP217a (retraining required every 12 months)	N/A
Activities that need only air-purifying respiratory protection. (Does not apply to filtering facepieces [dust masks])	All sites	RSP215a (retraining required every 12 months)	N/A
Manager roles that include the responsibility of overseeing the activities of persons who are authorized for respirator use.	All sites	RSP230 (retraining required every 12 months)	N/A
^a Medical approval shall be obtained at least 7 calendar days prior to practical exercise and fit testing.			

Members of the Workforce shall coordinate site- and hazard-specific training (e.g., [filtering facepieces \[dust masks\]](#) and emergency escape respirators) with the [Respiratory Protection Program Administrator \(RPPA\)](#) and the industrial hygiene representative on the appropriate [Division ES&H Team](#).

RESPIRATORY PROTECTION PROCESS

Requirements

Managers shall be responsible for:

- Implementing accepted engineering controls when practicable to assist in the prevention of occupational diseases caused by breathing air contaminated with potentially harmful dusts, fumes, sprays, mists, fog, smoke, vapors, or gases.
- Contacting the appropriate [Division ES&H Team](#) to conduct a worksite evaluation

to determine the need for respiratory protection if activities generate airborne contaminants (to evaluate chemical and biological hazards, contact the Industrial Hygiene representative on the Division ES&H Team and to evaluate radiological hazards, contact the Radiation Protection representative).



- Providing for the issuance of appropriate respirators to Members of the Workforce for any activity requiring a respirator.
- Enabling Members of the Workforce to obtain respiratory protection when requested.

Members of the Workforce shall use appropriate respirators (in accordance with the requirements of this section) if effective engineering controls are **not** feasible or while controls are being instituted.

Guidance

Members of the Workforce should:



- Consult the appropriate [Division ES&H Team](#) for further information.
- See Attachment 6C-1 ([Word file](#)/[Acrobat file](#)) for a summary of the respiratory protection process.

Members of the Workforce located at remote sites, including TTR and KTF, should see the appropriate [Division ES&H Team](#) for information on obtaining respiratory protection.

*MEDICAL REVIEW AND APPROVAL

Requirements

Members of the Workforce shall:



- Obtain medical review and approval:
 - At least 7 calendar days before the scheduled training, [fit testing](#), issuance,

or use of any form of respiratory protection except [filtering facepieces \(dust masks\)](#).

- At an interval determined by medical services personnel (Medical Clinic [3333] or Benefits and Health Services Department [8527]).
- Maintain current approval by medical services for authorized respirator use.
- Complete and submit SF 2001-MCR, Sandia National Laboratories/New Mexico Respiratory Protection Selection and Medical Evaluation ([Word file/Acrobat file](#)) or SF 2001-MCS, Sandia National Laboratories/California Respiratory Protection Selection and Medical Evaluation ([Word file/Acrobat file](#)) to obtain respiratory protection (if chemical or biological materials are involved in the activity, contact the Industrial Hygiene representative on the Division ES&H Team for assistance in completing the form. If radiological materials are involved in the activity, contact the Radiation Protection representative on the Division ES&H Team for assistance in completing the form).

Note: SF 2001-MCR or SF 2001-MCS are completed as necessary based on the need for medical review or when operational changes occur that may affect [respirator](#) type or cartridge being used. Medical services personnel will contact affected personnel to schedule an appointment as deemed necessary by a physician upon receipt and review of the forms. If no appointment is necessary, the completed form will be forwarded to respirator users and their managers. The original form is maintained by medical services personnel.

- Complete and submit the appropriate medical clearance form on the same cycle as medical review and approval unless activities affecting respirator use have changed.
- Notify their manager of any change in their medical status that may affect their ability to wear a respirator safely.

Note: The medical condition does not have to be disclosed, only its affect on respirator use.

Guidance

Managers should maintain a copy of SF 2001-MCR, SNL/NM Respiratory Protection

Selection and Medical Evaluation ([Word file/Acrobat file](#)) or SF 2001-MCS, SNL/CA Respiratory Protection Selection and Medical Evaluation ([Word file/Acrobat file](#)) for at least 1 year.

RESPIRATOR AUTHORIZATION CARDS

Requirements

Members of the Workforce shall:

- Obtain a Respirator Authorization Card (see Attachment [6C-2](#) for sample SNL/NM and SNL/CA cards) to ensure that they receive documented authorization. Authorization will be granted only if their medical approval, training, and [fit testing](#) are current.

Note:

- At SNL/NM, a respirator authorization card is issued to each respirator user upon completion of fit testing. This photo ID card documents that medical, training, and fit testing requirements are satisfied and the individual is approved for use of respirators specified on the card.
- At SNL/CA, the respirator authorization card does not have a photo and may be issued by either the appropriate industrial hygiene organization or Lawrence Livermore National Laboratory.
- Return the respirator authorization card to the [safety and health instrumentation contact](#) if:
 - Their medical status changes to the extent that [respirator](#) use is impacted.
 - They withdraw from the Respiratory Protection Program.
- Stop using a respirator upon expiration of any of the dates indicated on the respiratory authorization card.

Guidance

Members of the Workforce who use respirators should carry their respirator authorization card on their person when using a respirator.



ISSUANCE OF RESPIRATORS

Requirements

Members of the Workforce shall consult the industrial hygiene representative on the appropriate [Division ES&H Team](#) at SNL/NM or in [the Health and Safety Department \(8517\) at SNL/CA](#) to:

- Obtain approval for JIT or open market procurement of any type of [respirator](#) or respirator accessory.

Note: Approval will only be granted if the requester has current authorization and the proper respirator is being procured.



- Have the proposed use and respirator selection reviewed and approved prior to obtaining [filtering facepieces \(dust masks\)](#) for voluntary use directly from JIT or open market procurement.

Note: Initial issuance of respirators and cartridges are typically provided during [fit testing](#) or through the [safety and health instrumentation contact](#).

*RESPIRATOR USE

Requirements


Members of the Workforce who use respiratory protection shall:




- Complete the appropriate training and fit testing (see "[Training and Fit Testing](#)"),

obtain medical approval (see "[Medical Review and Approval](#)"), and complete fit testing (see "[Training and Fit Testing](#)") prior to using any respirator (except [filtering facepieces \(dust masks\)](#)).

- Receive instruction in the proper use, care, limitations, cleaning, capabilities, proper fit, storage, inspection, and disposal of respirators and accessories.
- Learn to recognize medical signs and symptoms that limit or prevent effective use of respirators.
- Use **only** the respirator that is issued to them and **not** wear a respirator issued to someone else.
- Install suitable in-line air-purifying sorbent beds and filters and alarms, as appropriate, on airline respirators.
- Ensure that the proper cartridges are installed on air-purifying respirators before use.
- Perform a user seal check test each time a respirator is donned.
- Properly don and remove respirators.
- For respirators (e.g., SCBA, emergency escape, or air-purifying) that may be used for emergency or rescue operations:
 - Perform and document monthly inspections of respirators.
 - Ensure that checklists are located with respirators **or readily available**.
 - Complete SF 2001-HAE, Hazard Analysis: Emergency and Rescue Use of Respiratory Protection ([Word file/Acrobat file](#)).
 - **Clean and sanitize after each use.**
- Ensure that respirators are inspected and in proper working order before and after each use.
- Leave the work area if irritation, discomfort, or any other problem arises associated with the proper working condition of respirators.

- 
- Report malfunctions and suspected problems with respirators to their Manager, the appropriate [Division ES&H Team](#), and the [Respiratory Protection Program Administrator \(RPPA\)](#)
 - Coordinate with the appropriate [Division ES&H Team](#) (Industrial Hygiene for chemical/biological hazards or Radiation Protection representative for radiological hazards) for a worksite assessment and respirator selection prior to issuance and use of a respirator or filtering facepiece (dust mask).
 - Consult the appropriate [Division ES&H Team](#) (Industrial Hygiene for chemical/biological hazards or Radiation Protection representative for radiological hazards) if changes occur in operational conditions that may impact potential exposure or respirator selection. Changes in conditions include:
 - Operational activities or processes (e.g., frequency, duration, location).
 - Worksite or personal conditions (e.g., physical effort, protective clothing, or temperature).
 - Equipment to control potentially hazardous exposures (e.g., engineering controls).
 - Material(s) used in an activity (e.g., formulation, amount).
 - Employee health concerns or requests.
 - **Not** make any modifications or alterations to respirators or accessories.
 - **Not** wear a [filtering facepiece \(dust mask\)](#) respirator if they know of medical conditions that might be aggravated by its use.

Managers responsible for Members of the Workforce who wear respirators shall:

- 
- Ensure that respirator users under their supervision are properly authorized and current in their authorization.
 - Be familiar with the process of fitting and issuing respirators.
 - Be familiar with the nature and extent of respiratory hazards to which persons

under their supervision may be exposed.

- Maintain familiarity with applicable requirements, procedures, and practices concerning [respirator](#) use.
- Be familiar with the principles and criteria for the selection of respirators used by persons under their supervision.
- Be able to recognize respirator use problems and be familiar with ways to resolve them.
- Ensure that Members of the Workforce under their supervision read, understand, and complete SF 2001-HAE, Hazard Analysis: Emergency and Rescue Use of Respiratory Protection ([Word file/Acrobat file](#)) when applicable.
- Periodically monitor respirator wearers for proper use of respirator equipment.
- Following modification or maintenance activities performed on the compressor unit or air delivery system, consult the appropriate [Division ES&H Team](#) at SNL/NM or the Health and Safety Department (8517) at SNL/CA for air sampling and system evaluation to ensure that the system is delivering human-respirable air.
- Ensure that respirators are properly used, stored, maintained, inspected, and controlled.
- Report malfunctions and suspected problems with respirators to the appropriate [Division ES&H Team](#) and the [Respiratory Protection Program Administrator \(RPPA\)](#).

PRESCRIPTION EYEWEAR

Requirements

Members of the Workforce who wear prescription glasses shall consult the [safety and health instrumentation contact](#) to obtain lens frame inserts for full-face respirators. The dispensing optician contact may be able to fill glasses lenses prescriptions as inserts in

RESPIRATOR FACEPIECE TO FACE SEAL

Requirements

Members of the Workforce shall:

- **Not** wear a [respirator](#), either positive or negative pressure, if:
 - Respirator head harness straps are positioned or worn over hard hats or over the [hood](#) of protection clothing.
 - Any head covering interferes with the facepiece-to-face seal.
 - Any condition (e.g., facial hair, corrective glasses, or other personal protective equipment) interferes with facepiece-to-face seal or valve function.
- Notify their manager, the appropriate [Division ES&H Team](#) at SNL/NM or the Health and Safety Department (8517) at SNL/CA, or the [safety and health instrumentation contact](#) if conditions contributing to respirator sealing problems occur, such as:
 - Weight change of 10 percent or more.
 - Significant facial scarring in the area of the facepiece seal.
 - Significant dental changes.
 - Reconstructive or cosmetic surgery.

Note: It is **not** necessary to disclose the exact nature of the condition that may affect the respirator seal, only that it is necessary to perform repeat fit testing.

*CLEANING AND DISPOSAL

Requirements

Members of the Workforce shall:

- Clean and sanitize respirators to the extent necessary to ensure the proper operation and performance of the respirator.
- Remove cartridges prior to immersing or soaking the respirator in sanitizing solution.

Note: Members of the Workforce may clean the respirator or take it to the [safety and health instrumentation contact](#) for sanitizing. **Members of the Workforce at SNL/CA may clean the respirator or return it to the Lawrence Livermore National Laboratory Respirator Shop for sanitizing.**

- Consult the radiation protection representative on the appropriate [Division ES&H Team](#) at SNL/NM or the Health and Safety Department (8517) at SNL/CA to survey respirators used for working with radiological material.
- For respirators used in the presence of radiological material, complete a radiological release tag prior to cleaning or returning respirators to the [safety and health instrumentation contact](#).
- Dispose of all chemical and filter cartridges (including unused cartridges), contaminated respirators, and respirators that cannot be adequately cleaned as hazardous waste (see [Section 19A](#), "Hazardous Waste Management.")

Note: Clean, unused respirators may be returned to [safety and health instrumentation contact](#).

- Dispose of respirators with radiological contamination as radioactive waste (see [Section 19B](#), "Low-Level Radioactive Waste Management.")


Note: Respirator users are responsible for completing the appropriate forms associated with hazardous or radioactive waste disposal. Disposal requirements differ for different items. Consult the environmental contact on the appropriate

[Division ES&H Team](#) at SNL/NM or the Environmental Operations Department (8516) at SNL/CA for assistance.

- **Not** discard respirators or cartridges as trash, or send them to property reapplication

Guidance


After each use, Members of the Workforce should:

- 
- Clean lightly soiled respirators with soapy water or wipe the [respirator](#) with cleaning-disinfectant wet-wipes available through JIT.
 - Allow respirators to air dry in a clean location.
-

REPAIR AND MAINTENANCE

Requirements


Members of the Workforce shall:

- 
- **Not** attempt to repair or replace parts other than cartridges.
 - Return clean, uncontaminated respirators requiring maintenance or repair to the [safety and health instrumentation contact](#). (A replacement respirator may be issued at that time.)
-

STORAGE

Requirements

Members of the Workforce shall:

- 
- **Not** store [respirators](#) in such places as lockers and toolboxes, unless they are protected from contamination, distortion, and damage.
 - Store respirators in a manner that will protect them against physical and chemical agents such as vibration, shocks, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals.
 - Position respirators in storage containers to prevent distortion of rubber or other elastomeric parts.
 - Place emergency and rescue-use respirators in a clearly marked storage cabinet or container that is quickly accessible at all times.
-



***FILTERING FACEPIECES (DUST MASKS)**

Requirements

Members of the Workforce shall:

- Obtain authorization for the use of a filtering facepiece (dust mask) from the industrial hygiene representative on the appropriate [Division ES&H Team](#) at SNL/NM or the Health and Safety Department (8517) at SNL/CA.
 - Read and be familiar with the information from 29 CFR 1910.134, Appendix D presented in Attachment 6C-3 prior to the use of any [filtering facepiece \(dust mask\)](#).
-




WITHDRAWAL FROM THE RESPIRATORY PROTECTION PROGRAM

Requirements


At SNL/CA, Members of the Workforce shall consult the [respiratory protection staff](#)

contact to withdraw from the Respiratory Protection Program.

At SNL/NM, Members of the Workforce shall complete the following steps to withdraw from the Respiratory Protection Program:



Step	Action
1	Obtain an SF 2001-WN (Word file / Acrobat file).
2	Read and sign the form.
3	Obtain manager's signature.
4	Forward the form to the Industrial Hygiene Administrator at SNL/NM or the industrial hygiene records contact at SNL/CA.
5	Return respirator authorization card to the safety and health instrumentation contact .
6	Return clean, unused respirators to the safety and health instrumentation contact or dispose of used respirators and filters or chemical cartridges (used or unused) as described in the section " Cleaning and Disposal ."



Managers shall, after an individual completes the withdrawal procedure, remove the course from the individual's TEDS training notebook so they will not continue to receive recall notices.

*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to respiratory protection include:

Hazard/Activity	Reference
Confined spaces	Section 6I , "Confined Space Entry"

Handling chemicals	GN470094 , <i>Handling Chemicals at SNL/CA Section 6D</i> , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan" ^a
Medical emergencies and examinations	Chapter 16 , "Health, Benefits, and Employee Services"
Radiological hazards	MN471016 , <i>Radiological Protection Procedures Manual</i>
Personal protective equipment (PPE)	Section 4L , "Personal Protective Equipment (PPE)"
Hazardous waste	Section 19A , "Hazardous Waste Management"
Radioactive waste	Section 19B , "Low-Level Radioactive Waste Management"
^a Includes Attachment 6E-1, Sample Standard Operating Procedure (SOP) for Working With Hazardous Chemicals at SNL/NM, TTR, KTF, and Remote Sites (Word file/Acrobat file).	

REFERENCES

Requirements Source Documents

[29 CFR 1910.134](#), *Respiratory Protection*.

ANSI Z88.2-1992, *Respiratory Protection*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [MN471011](#), *Sandia Explosives Safety Manual*.

SNL, [MN471016](#), *Radiological Protection Procedures Manual*.

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program.*

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program.*

SNL, [PG470218](#), *Worker Protection Program (WPP).*

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ES&H Manual

***SECTION 6P – LOCAL EXHAUST VENTILATION (LEV)**

Subject Matter Expert: [Chad Hjorth](#); CA Counterpart: [Dan Kuey](#)

MN471001, Issue E

Revision Date: [June 26, 2006](#); Replaces Document Dated: November 14, 2002

Administrative Changes: [November 2, 2006](#)

*Indicates a substantive change



- [Applicability](#)
 - [*Determination of Need for Local Exhaust Ventilation \(LEV\) Equipment](#)
 - [*Installation/Removal of Local Exhaust Ventilation \(LEV\) Equipment](#)
 - [*Use of Local Exhaust Ventilation \(LEV\) Equipment](#)
 - [Repair/Modification of Local Exhaust Ventilation \(LEV\) Equipment](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Attachments
 - [6P-1](#) - Airflow Indicators
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Contractor employees as specified in [Section 1B](#), "What is the Scope"

This section applies to all activities involving [local exhaust ventilation \(LEV\)](#) equipment used to control hazards, which include but are not limited to chemical, radiological, and biological hazards on [Sandia-controlled premises](#).

This section does **not** apply to laminar flow hoods and biological safety cabinets used exclusively to protect product.



*DETERMINATION OF NEED FOR LOCAL EXHAUST VENTILATION (LEV) EQUIPMENT

*Requirements

Managers shall identify potential hazards that may require [local exhaust ventilation \(LEV\)](#) (see [Related Hazards and Activities](#)"; [Chapter 2](#), "Cross-Cutting Elements"; and [Chapter 13](#), "Hazards Identification/Analysis and Risk Management").

Members of the Workforce shall contact the [Division ES&H Team](#) for guidance during this process (per the Occupational Exposure Assessment Process) in order to receive assistance in:



- Determining the best type of exposure control, which may include LEV.
- Assessing whether existing LEV is adequate to control potential hazards from new, modified, or unevaluated operations.

Guidance

Consider the following LEV design principles to determine the most effective ventilation design:

- Locate LEV as close to emissions source as practical.
- Enclose as much of the process as practical; even partial enclosure on one or two sides can greatly increase the efficiency of the ventilation and decrease the



amount of air that needs to be exhausted for effective contaminant control.

- Flanges and baffles on capture-type LEV devices (e.g. “elephant trunks”) can greatly increase the efficiency of the ventilation and decrease the amount of air that needs to be exhausted for effective contaminant control.
- Canopy hoods are not a very effective or efficient way to capture effluent, except sometimes for heat. If you are considering using a canopy hood, consider whether there is a more effective method of contaminant capture; contact your [Division ES&H Support Team](#) for additional information.
- Competing air currents, such as drafts, foot traffic, and other LEV equipment, can affect the effectiveness of an LEV device; identify these sources and adapt accordingly.



*INSTALLATION/REMOVAL OF LOCAL EXHAUST VENTILATION (LEV) EQUIPMENT

*Requirements

Managers shall be responsible for ensuring that:

- Hazards removed by [Local exhaust ventilation \(LEV\)](#) are exhausted to the outside whenever the equipment is designed to capture:
 - Hazardous chemicals, except for particulate control by portable devices specifically designed not to require discharge to the outside.
 - Biological agents, except for LEV devices specifically designed not to require discharge to the outside.
 - Radiological materials, except for particulate control by portable LEV devices specifically designed not to require discharge to the outside.
 - Unwanted heat or moisture.



Note: Recirculation of exhaust may be permitted, on a case-by-case basis, if the requirements of the current version of ANSI/AIHA Z9.7 are met. Consult the appropriate [Division ES&H Team](#) member.



- [Sandia Facilities](#) is contacted for guidance and requirements associated with [LEV](#) installation.

Exception: For portable LEV, such as glovebags and temporary HEPA-filtered enclosures that **do not** use building LEV equipment (e.g., fans and ductwork), managers should consult the appropriate [Division ES&H Team](#) member.

- Requirements of [Chapter 17](#), "Air Emissions," are met for operations that involve hazardous or radioactive materials.

Managers shall notify the [LEV Program contact](#) of the installation or removal of LEV equipment.

Managers shall consult the appropriate [Division ES&H Team](#) member to reinforce the requirements listed above.

Members of the Workforce shall consult the appropriate [Division ES&H Team](#) member when:

- They have questions regarding LEV equipment.
- Air emission control devices are being considered.
- Material exhausted presents an environmental concern.

Guidance

Managers should:

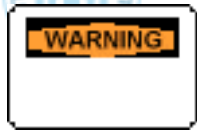
- Submit a facilities work request to the [facilities support](#) contact to arrange installation or removal of LEV equipment in a work area rather than attempting to complete the installation themselves.
- Ensure that airflow indicators are properly maintained on LEV equipment (see



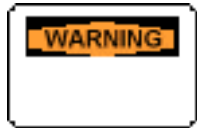
[Attachment 6P-1](#) for more information).

*USE OF LOCAL EXHAUST VENTILATION (LEV) EQUIPMENT

*Requirements



Warning: [Operability validation](#) of a piece of LEV equipment indicates that the equipment is performing within performance criteria in the operational configuration in place at the time of testing. It does **not** assure that exposure to potential hazards is adequately controlled. Consult the appropriate [Division ES&H Team](#) member for assistance in evaluating the adequacy of hazard controls.



Warning: [Operability validation](#) of LEV equipment indicates that the equipment met performance criteria in the work configuration and LEV system operating conditions in place at the time of the test. Changes in work configuration or the performance of the LEV system may affect the performance of the LEV equipment.

Managers shall be responsible for ensuring that:


- New LEV systems pass an [operability validation](#) prior to initial use.
- An [operability validation](#) performed by [LEV program contacts](#) is passed annually, or even more frequently if required by regulation, on [local exhaust ventilation \(LEV\)](#) equipment. **Managers shall** consult the appropriate Division ES&H Team member for guidance on performance of validation or applicable [operability validation](#) frequency.

Note: Requirements for testing more frequently than yearly are governed by regulations for the substance being controlled by the LEV (e.g. lead); consult regulations for specific materials being used.

- 
- The LEV system is suitable for the material that is exhausted.

Note: Perchloric acid, radioactive materials, flammable materials, biological agents, and dusts are examples of materials that may have special ventilation system requirements. Also, certain LEV systems (e.g., systems containing HEPA filters) may have limitations on the materials for which they can be used (e.g., moisture may damage HEPA filters). **Managers shall consult the appropriate [Division ES&H Team](#) member for guidance.**

- If LEV equipment fails to pass [operability validation](#), such equipment is tagged out of service and operations are placed in a safe condition until corrective actions are completed, and the hood passes an operability validation.
- Performance criteria meet the requirements established by the Sandia LEV Program. **Managers shall consult the appropriate [Division ES&H Team](#) member for more information.**
- Periodic checks are performed to validate that LEV equipment functions properly.



Note: The assurance necessary (frequency and method) for LEV equipment varies, depending on the hazard being controlled and the consequence of inadequate LEV operation. Possible assurances include continuous flow monitors, manometers, alarms, interlocks, periodic checks with a hand-held velometer, and visual-flow indicators, such as a strip of paper. **Managers shall consult the appropriate [Division ES&H Support Team](#) member or Attachment 6P-1, "[Air-Flow Indicators](#)" for additional guidance.**

- An [operability validation](#) is performed when there is a reason to believe that LEV equipment used for hazard control is not operating in accordance with performance or design specifications.
- [Operability validation](#) labels on LEV equipment are up-to-date. Consult the appropriate [Division ES&H Team](#) member if the label is out-of-date.
- Annual hazardous material or radiological release inventories are maintained and submitted, if required per [Chapter 17](#), "Air Emissions."

Operability Validations

Managers shall consult the appropriate [Division ES&H Team](#) member for assistance with annual [operability validation](#) of LEV equipment and to obtain the following services:

- Face velocity or capture velocity measurements
- Visible smoke capture tests, such as smoke, dry ice, and carbon dioxide fogger
- Function checks for newly installed airflow indicators
- Attachment of [operability validation](#) labels to LEV equipment that passes performance tests

Effectiveness of Equipment

Managers shall consult the appropriate [Division ES&H Team](#) member when:

- LEV equipment used to control radioactive, carcinogenic, toxic, or special biological materials fails.
- There is a reason to believe the equipment is no longer operating in accordance with performance or design specifications.

Members of the Workforce shall consult the appropriate [Division ES&H Team](#) member to obtain the following services:

- Evaluation of the effectiveness of the LEV equipment in controlling potential hazards
- Guidance on whether a process change affects the capability of the LEV equipment to control potential hazards. Process changes include:
 - Additional process equipment in the LEV equipment
 - Reconfiguration of process equipment with respect to LEV equipment, including the distance between the process and LEV
 - Change of process materials
 - Modification of the LEV system

- Modification of the lab or building ventilation system
- Relocation of the LEV equipment
- Introduction of processes that impart heat or velocity to potential hazards

Guidance

Effectiveness of Equipment

Managers should install a real-time performance monitor if failed LEV performance could result in hazardous conditions; the performance monitor report or output should be accessible to users of the LEV equipment.

Managers should consider necessary actions in the event of LEV failure, and incorporate those actions into appropriate [technical work documents \(TWDs\)](#).

Safe Practices

Members of the Workforce should observe the following safe work practices when using a laboratory fume hood:

- Be aware of indications that the exhaust hood is not functioning properly, such as low airflow, inappropriate odors, or other unusual situations.
- Lower the hood sash to achieve optimal containment.
- Keep laboratory doors closed unless the laboratory design requires doors to be open.
- Move the sash slowly to maintain effective airflow.
- Move objects, including hands, in and out of the hood slowly, so as to minimize disturbance to the airflow and consequent decrease in hazard containment.
- Minimize foot traffic past the face of the hood.
- Do **not** use LEV equipment when an alarm or warning light activates. Consult the appropriate [Division ES&H Team](#) member.



- Report instances of inadequate air velocity that could cause injury or illness, damage to property, or damage to the environment according to procedures in [Chapter 15](#), "Emergency Preparedness and Management."
- Be aware of airflow indicators and how to use them as stated in [Attachment 6P-1](#), which describes the most common types used at SNL.
- Consult the appropriate [Division ES&H Team](#) member to obtain specific guidance on using LEV equipment.

Members of the Workforce should **not**:

- Put their heads in a laboratory fume hood during generation of contaminants.
- Store chemicals or equipment in a laboratory fume hood.
- Place electrical receptacles or other spark sources inside a laboratory fume hood when flammable liquids or gases are present (**exception**: listed intrinsically safe equipment in accordance with the National Electric Code).
- Load a laboratory fume hood in a manner that could interfere with proper airflow.



REPAIR/MODIFICATION OF LOCAL EXHAUST VENTILATION (LEV) EQUIPMENT

Requirements

Managers shall be responsible for ensuring that:



- The [facilities support](#) contact is consulted for necessary repairs or modifications rather than attempting any maintenance or repair of [LEV](#) equipment themselves.

Note: This includes adjustment of dampers. (**Exception:** Dampers that have been specifically approved by the [LEV Program contact](#) for user adjustment.)

- [Operability validation](#) is passed after the completion of all repairs, modifications, or maintenance on LEV equipment.

Guidance

Members of the Workforce should report LEV equipment problems to [Telecon Plus](#) (844-4571) or [Facilities Management](#) at SNL/CA.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [local exhaust ventilation \(LEV\)](#) include:

Hazard/Activity	Reference
Air emissions	Chapter 17 , "Air Emissions"
Exposure to hazardous chemicals in a work area that is exempt from the Laboratory Standard	Section 6D , "Hazard Communication Standard"
Work involving hazardous chemicals	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Indoor air quality	Section 6R , "Indoor Air Quality"
Ventilation for radiological hazards	MN471016, <i>Radiation Protection Procedures Manual (RPPM)</i> , Chapter 7 , "Radiological Design and Control and ALARA Application"
Customer-funded, small remodeling activities at SNL/NM	Request for Site Service Form Jobsite Hazard Evaluation Checklist

REFERENCES

Requirements Source Documents

[29 CFR 1910.94](#), *Ventilation*.

[29 CFR 1910.107](#), *Spray Finishing Using Flammable and Combustible Materials*.

[29 CFR 1910.120](#), *Hazardous Waste Operations and Emergency Response*. [29 CFR 1910.120-126](#), *Dipping and Coating Operations*.

[29 CFR 1910.252](#), *General Requirements*.

[29 CFR 1910.1450](#), *Hazard Communication*.

[29 CFR 1910, Subpart Q](#), *Welding, Cutting and Brazing*.

ANSI/AIHA Z9.2-2001, *Fundamentals Governing the Design and Operation of Local Exhaust Systems*.

ANSI/AIHA Z9.7-1998, *Recirculation of Air From Industrial Process Exhaust Systems*.

[DE-AC04-94AL85000](#), *Management and Operating Contract Between Sandia Corporation and DOE*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

NSF/ANSI 49-2002, *Class II (Laminar Flow) Biohazard Cabinetry*.

U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes of Health, [Biosafety in Microbiological and Biomedical Laboratories](#), Fourth Edition, May 1999.

Implementing Documents

SNL, [GN470094](#), *Handling Chemicals at SNL/CA*.

SNL, [MN471011](#), *Sandia Explosives Safety Manual*.

SNL, [MN471016](#), *Radiological Protection Procedures Manual*.

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

American Conference of Government Industrial Hygienists (ACGIH), *Industrial Ventilation: A Manual of Recommended Practice*, 24th Edition, Cincinnati, OH, 2001.

ANSI/AIHA Z9.5-1992, *American National Standard for Laboratory Ventilation*.

Diberardinis, Louis J., et al., *Guidelines for Laboratory Design, Health and Safety Considerations*, Wiley and Sons, October 1987.

NFPA 45, *Protection for Laboratories Using Chemicals*.

NFPA 70, *National Electric Code*.

SNL, [GN470000](#), *Developing and Implementing ES&H SOPs and SWPs*.

SNL, *Industrial Hygiene Exhaust Hood Safety Brochure*.

SNL, *Procurement Manual*, [Section 3.1.2.5](#), "Special Handling and Notification Copies."

Young, J. A., Ed., *Improving Safety in the Chemical Laboratory: A Practical Guide*, Wiley & Sons, 1991.



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ES&H Manual

* ATTACHMENT 1D-4 – OPERATING PROCESS FOR STANDING ES&H COMMITTEES

Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)

MN471001, Issue P (O not used)

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* Indicates a substantive change

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- [Committee Principles](#)
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- [Canceling a Standing ES&H Committee](#)
- Attachments:
 - [1D-4A](#) – Sample Nomination Memo for a Standing ES&H Committee Chair
 - [1D-4B](#) – Standard Format for Standing ES&H Committee Charters
 - [1D-4C](#) – Sample Memo Requesting Cancellation of a Standing ES&H Committee

Summary

ES&H Manual Chapter 1, Section D provides guidance for SNL - Standing ES&H Committees at SNL sites. It contains information and instructions for the ES&H and

Emergency Management Center Director, functional managers (department managers for the applicable ES&H program), and committee chairs, secretaries, and members.

Applicability

This document applies to all persons involved in establishing, operating, or participating on a Standing ES&H Committee and report to the ES&H and Emergency Management Center Director. These Standing ES&H Committees support continuous (long term) ES&H Programs. This document does not apply to temporary or ad hoc committees that have been formed to address short-term projects or individual organizational concerns.

Organizing a Standing ES&H Committee

A Standing ES&H Committee can be requested by any Sandia employee. The ES&H functional manager shall initiate the committee in those cases in which DOE / NNSA Orders require a safety committee. The initiator prepares a memo to the ES&H and Emergency Management Center Director that explains the need for the Standing ES&H Committee and the scope and purpose of the committee. Once approved by the ES&H and Emergency Management Center Director, the initiator then nominates a Chair (Attachment 1D-4A), obtains approval, and with the Chair, assembles an initial membership, and prepares the charter. Committee operation may begin as soon as the ES&H and Emergency Management Center Director approves the charter. To the extent applicable, existing committees shall revise their charters to the format and content described in Attachment 1D-4B.

Committee Principles

The mission of the Standing ES&H Committees is to assist line organizations in creating a safe and compliant work environment as applicable to the committee's discipline. Standing ES&H Committees provide an opportunity for additional worker involvement with ES&H personnel and processes based on the principle of Line ownership of safety and environmental matters. The committees comprise workers (or


their representatives), supervisors, and technically competent members from line organizations as well as the ES&H and assurance organizations. Committees are responsible for providing guidance in support of the Line's mission requirements. When applicable, committee approval authority will be formally delegated and defined in the committee charter. Committee priorities include assistance in developing and maintaining the ability to recognize hazards and provide appropriate work controls and assurance methods to reduce the risks associated with the Lab's operations as well as compliance with all applicable consensus standards, laws, and DOE orders.

Purpose, Objectives, and Responsibilities

Standing ES&H Committees are advisory committees that provide oversight of ES&H programs and help to ensure consistency in program implementation throughout Sandia. Standing ES&H Committees do not usurp the authority or responsibility that is formally assigned to line or ES&H management. The responsibility and authority of Standing ES&H Committees is to review assigned ES&H areas and provide assistance or recommendations as appropriate to responsible managers. Workers and their elected representatives serve on Standing ES&H Committees and through their participation assist in the development of the worker safety and health program goals, objectives, and performance measures; and assist in the identification and control of hazards in the workplace. In addition, Standing ES&H Committees provide recommended interpretations of requirements such as National Consensus Standards (e.g., the National Electric Code), DOE / NNSA Orders, and SNL and DOE / NNSA safety manuals when questions arise concerning the meaning or applicability of requirements. They also serve as an independent technical resource and provide expertise for supporting and implementing the SNL ISMS principles and, in particular, assist in identifying, analyzing, communicating, and documenting the resolution of safety issues.


Tasks undertaken by Standing ES&H Committees may include the following:

- Inform management about ES&H issues, requirements, and trends.
- Recommend the interpretation and application of laws, regulations, DOE / NNSA Orders, codes, policies, and standards throughout SNL.
- Develop, review, and recommend for approval, ES&H Manual chapters, sections, and/or supplements.

- 
- Develop, review, and recommend for approval training courses.
 - As requested, review experiment plans, test plans, and job hazard analyses and provide associated recommendations. This includes the identification of hazards and controls for specific work activities.
 - Assist in root cause analyses or investigations of occurrences or incidents.
 - Assist responsible managers in performing self assessments as required by the ES&H and Emergency Management Center or other requirements. These self assessments should include an evaluation and recommendations on the program elements, implementation issues, and the status of cultural issues for areas under the committee's cognizance.
 - Review the underlying ES&H principles as applied to the committee's functions and provide recommendations to improve processes, systems and performance.
 - Benchmark the implementation of committees' underlying ES&H program and recommend improvements.
 - Participate in DOE / NNSA, industry, and standards working groups.
 - Provide review and approval for research projects or test plans (with the applicable review and approval authority defined in the committee charter).
 - Review the underlying ES&H Program goals, objectives and performance measures and provide recommended improvements.
-

Roles and Responsibilities

ES&H and Emergency Management Center Director (or delegate)

- 
- Approves initiation or cancellation of committees.
 - Approves committee charters.
 - Note that some committees may be chartered at a higher level of

management.

- Approves chair nominations.

ES&H Functional Manager for the applicable site (or delegate)

- Recommends establishing ([Attachment 1D-4A](#)) or canceling ([Attachment 1D-4C](#)) Standing ES&H Committees.
- Provides information to the SME for *ES&H Manual*, Chapter 1D for maintaining the list of ES&H Standing Committees (Attachment 1D-3) current.
- Identifies tasks to be accomplished by the committee and communicates with the Chair.

Chair (or delegate – delegates are recommended by the Chair and designated in a memo from the functional manager)

- Assigns members and appoints the secretary.
- Leads the committee.
- Prepares an annual report.
- Reviews (at least annually) and updates (as necessary) the committee charter.
- Conducts meetings.
- Executes tasks assigned by the ES&H and Emergency Management Center Director or the functional manager.
- Interfaces with NNSA and National Committees as appropriate, or assigns delegates.

Secretary

- Maintains committee records.
- Prepares and distributes meeting minutes (including action items).



- Maintains the committee roster.
- Schedules meetings.
- Maintains the committee web site (standing committees are encouraged to have a web site), and ensures that the current committee charter, membership list, meeting minutes, and reports current charter, meeting minutes, reports, and member list are posted on the web site.

Members

- Attend and participate in meetings.
- Complete tasks assigned by the Chair.
- Review technical work documents, as required and as appropriate.
- Bring issues to the committee for resolution.



Qualifications / Committee Membership

The chair, secretary, and members must be qualified by education, experience, or job assignment appropriate to the purpose of the committee. The Standing ES&H Committee shall involve workers and their elected representatives in the development of worker safety and health program goals, objectives, performance measures, and in the identification and control of hazards in the workplace. An individual(s) who is a subject matter expert for the committee's assigned scope shall be a member.

The membership should reflect the make-up of organizations most likely to be affected by, or involved with, the committee's actions. Hence, ample representation and participation from line organizations is assured. The Committee Chair formally issues invitations to proposed committee members and, upon acceptance, formally assigns members to the committee. Workers or their elected representatives (e.g. Union representation) are invited to participate as committee members. Representation from any related subject matter areas should also be considered.

ES&H professionals in the discipline addressed by the committee are essential

members. For example, explosives safety engineers and members from organizations using or transporting explosives would be the logical members of an explosives safety committee. Sandia employees or contractors may be committee members. The Chair of these committees will be selected in accordance with the [CPR500.1.1](#), *Financial Manual* requirements.



Interfaces

Standing ES&H Committees should interface with other groups at Sandia and DOE / NNSA as applicable to the function of the committee. SME consultations as well as annual reports, meeting minutes, or action items shall be made available to the following interfaces upon request. Interfaces shall include:

- The Laboratory Leadership Team (LLT) Safety Committee
- The ES&H and Emergency Management Center Director
- The following interfaces are also included as applicable:
 - DOE / NNSA working groups
 - The Line Implementation Working group (LIWG)
 - Applicable procurement organizations
 - The SNL Legal organization
 - Other Lessons Learned programs
 - The work force affected by the program. Depending on the committee purpose, an easily assessable homepage may be recommended – with a method for workers to subscribe to that homepage for purposes of distributing Lessons Learned or other committee functions.



Committee Authority

As discussed in Purpose, Objectives and Responsibilities above, the authority of

standing committees is advisory only; however, some committees may have authority delegated by management for specific approval functions as discussed in “tasks” above. In these cases, the specific authority shall be defined in the respective committee charter and delegated and approved by the line or ES&H manager in which that approval authority resides.

Operational Guidelines

Standing safety committees may address their specific operational guidelines (frequency of meetings, decision process, etc.) in their respective charter.

Management Review and Annual Report

The chair shall prepare an annual report describing the committee's activities and accomplishments, and shall transmit the report to the ES&H and Emergency Management Center Director no later than September 30. The report should provide sufficient detail for the uninformed reader to conclude that the committee enhances worker protection and adds value to Sandia operations and activities. This report can be shared with the LLT Safety Committee upon request or at the discretion of ES&H and Emergency Management Center Director.

Standing safety committees may address meeting minutes or other documentation in their respective charter.

Records

Required

The ES&H standing committee chair (or delegate) shall maintain these records for each committee:

- Approved initiating memo (not required for existing committees).
- Current approved charter.
- Approved nomination memos for the Chair (not required for existing committees) and committee membership.
- Annual Reports.

Recommended



- The committee secretary should maintain these records:
 - Meeting minutes (including action items).
 - All committee work products (e.g., white papers, travel reports concerning participation in DOE / NNSA or National Standards meetings, memos documenting reviews or interpretations of requirements).
-

Canceling a Standing ES&H Committee

To cancel a committee, the chair submits a memo (Attachment 1D-4C) to the ES&H and Emergency Management Center Director that describes the reasons why the committee should be cancelled, and requests approval for cancellation. The committee is formally cancelled when the director approves the cancellation request. Once cancelled, all records (those maintained by the ES&H and Emergency Management Center Director and the secretary) shall be transferred to the SNL Customer Funded Record Center repository for the applicable site where the committee resides.



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ES&H Manual

*SECTION 4F - LADDERS, SCAFFOLDS, AND ELEVATING WORK PLATFORMS

Subject Matter Expert: [Danny Donald](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue H

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* Indicates a substantive change

- [Applicability](#)
- [Training](#)
- [Ladder Selection](#)
- [*General Ladder, Scaffold, and Elevated Work Platform Safety](#)
- [*Ladder, Scaffold, and Elevated Work Platform Maintenance and Inspection](#)
- [*Elevating Work Platforms](#)
- [Related Hazards and Activities](#)
- [*References](#)
- [*Forms](#)
 - [*SF 2001-LSG, Ladder Safety Guidelines and Inspection Checklist \(Word file/Acrobat file\)](#)
 - [*SF 2001-SGI, Scaffold Safety Guidelines and Inspection Checklist \(Word file/Acrobat file\)](#)
 - SF 2001-IEW, Periodic Use Inspection Form: Elevating Work Platform ([Word file/Acrobat file](#))
 - SF 2001-PEW, Pre-Use Inspection Form: Elevating Work Platform ([Word file/Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce whose work activities involve the use of ladders, scaffolds, and [elevating work platforms](#).

TRAINING

Requirements

Managers shall ensure that:

- Members of the Workforce whose job duties involve the use of ladders, scaffolds, or [elevating work platforms](#) receive initial instruction, as appropriate, and refresher instruction, as necessary.

Note: Training can be formal, [on-the-job training \(OJT\)](#), and specialized training, as appropriate.

- **Training includes at a minimum:**
 - Manufacturers' operating and maintenance manuals/instructions.
 - Safe equipment set up and operation.
 - Basic inspection procedures.
 - **Personal fall protection equipment inspection, care, and use.**
 - Awareness of organization-specific [technical work documents \(TWDs\)](#).

Guidance

Managers can get training from equipment manufacturers or authorized vendors. See the [ladder safety](#), [scaffold](#), or [elevating work platform](#) contact for information about training options.

LADDER SELECTION

Requirements

Members of the Workforce shall:

- Review their ladder requirements with their [Division ES&H Team](#) before initiating a ladder requisition to ensure selection of the proper ladder type and to resolve questions concerning the design and safe load limits.
- Select the appropriate ladder based on the task, vertical height or elevation, and environment.
- Use the following chart to determine the duty rating capacity of the ladder based on the anticipated use:

Duty Designation	Load Rating (in lbs)
Extra heavy duty (IA)	300 load rating
Heavy duty (I)	250
Medium duty (II)	225
Light duty (III)	200

Guidance

Members of the Workforce should purchase only extra heavy duty (IA) type ladders.

Members of the Workforce whose activities require **the use of either** both hands or heavy tools from an elevated position should **perform these activities** from a scaffold or platform, not from a ladder.

***GENERAL LADDER, SCAFFOLD, AND ELEVATING WORK PLATFORM SAFETY**



Members of the Workforce who use ladders shall observe manufacturers' data.

Note: Additional safety practices are available in SF 2001-LSG, Ladder Safety Guidelines and Inspection Checklist ([Word file](#)/[Acrobat file](#)).

Members of the Workforce who work on scaffolds or who are having a scaffold installed shall observe the manufacturers' data.

Note: Additional safety practices are available in SF 2001-SGI, Scaffold Safety Guidelines and Inspection Checklist ([Word file](#)/[Acrobat file](#)).

Members of the Workforce who work on [elevating work platforms](#) shall read the manufacturer's operating instruction(s) and user safety rules, or be trained by a qualified competent operator on the contents of the manufacturer's operating instruction(s), users safety rules, and decals, warnings, and instructions that may be displayed on the platform.

Guidance

Managers should review scaffold requirements with their [Division ES&H Team](#) before initiating a scaffold requisition to ensure selection of the proper scaffold type and to resolve questions concerning the design, safe load limits, and training.

Members of the Workforce may use the [scaffold inspection checklist](#) provided in SF 2001-SGI, Scaffold Safety Guidelines and Inspection Checklist ([Word file](#)/[Acrobat file](#)) when performing scaffold inspections.



***LADDER, SCAFFOLD, AND ELEVATING WORK PLATFORM MAINTENANCE AND INSPECTION**

Requirements

Members of the Workforce shall ensure that ladders, fixed ladder systems, **scaffolds, and elevating work platforms** are maintained in a safe condition by performing the following:

- Inspect for defects (i.e., corrosion and deterioration), if any, according to the manufacturer's recommendations and ensure that all bolts and welded units are in place and secure before **the item** is used.



Note: More frequent inspections may need to be made as determined by use and exposure conditions.

- Remove from use any ladders, **fixed ladder systems, scaffolds, or elevating work platforms** that have been disabled or discarded.
- Report any suspect or counterfeit items or materials related to any of these items as an occurrence.

Note: See the Suspect/Counterfeit Items Program [website](#) for additional information and mitigation assistance with suspect and counterfeit items. See [Section 18C](#), "Reporting, Investigating, and Correcting ES&H Events," for reporting requirements.



- Repair and remove from service any defective or damaged ladders, fixed ladder systems, scaffolds, or elevating work platforms (i.e., any fastening bolts or welded units are missing or if the joints between the rungs and the side rails are loose).

Note: For repairs, contact [Telecon Plus](#) or the [ES&H Hotline](#).

Guidance

Members of the Workforce should:

- Store ladders and portable scaffolds in tool cribs or other designated storage areas.
- Observe the following guidelines:



- Straight ladders and extension ladders should be supported on their sides in racks or hung on wall brackets. A ladder that is more than 12 feet long should be supported at three points to prevent warping.
- All ladder equipment should be securely fastened to a ladder rack or similar supporting device when being transported to minimize chafing or damage from vibration. The ladder rack should be covered with cloth, rubber, or wood to absorb road vibration.

Members of the Workforce may use the following forms to document inspections:

- SF 2001-LSG, Ladder Safety Guidelines and Inspection Checklist ([Word file](#)/[Acrobat file](#))
- SF 2001-SGI, Scaffold Safety Guidelines and Inspection Checklist ([Word file](#)/[Acrobat file](#))
- SF 2001-IEW, Periodic Use Inspection Form: Elevating Work Platform ([Word file](#)/[Acrobat file](#))
- SF 2001-PEW, Pre-Use Inspection Form: Elevating Work Platform ([Word file](#)/[Acrobat file](#))



*ELEVATING WORK PLATFORMS

Requirements



Managers whose Members of the Workforce use [elevating work platforms](#) shall ensure that:

- Only [authorized, qualified operators](#) are allowed to operate elevating work platforms, and that prior to using a platform, the operator has been provided with approved fall protection devices and other safety gear for all **Members of the Workforce** on the platform.

- Authorized, qualified operators are re-trained in the event of a change in work site conditions (e.g., additional hazards), as appropriate.
- The purpose is within the scope of the intended applications defined by the manufacturer.



- The area in which the platform is to be used is inspected for possible hazards, such as, but not limited to:

- Drop-offs.
- Bumps and floor obstructions.
- Debris.
- Overhead obstructions and high-voltage conductors.
- Inadequate surfaces and supports to withstand all load forces imposed by the platform in all operating configurations.
- Wind and weather conditions.
- Presence of unauthorized persons.



- Written consent is obtained from the manufacturer before modifying any elevating work platform.
- Equipment modifications are made only by authorized mechanics.
- All replacement parts or components are identical or equivalent to parts or components installed on the original elevating work platform.

Note: See the Suspect and Counterfeit Items (S/CIs) [website](#) for additional information.

- Platforms intended for use around electrically energized components meet the electrical re-testing and maintenance criteria set forth by the manufacturer. See the [elevating work platform contact](#) for requirements and testing.



- Periodic inspections are performed and documented using SF 2001-IEW, Periodic

Use Inspection Form: Elevating Work Platform [[Word file](#)/[Acrobat file](#)], by a competent Member of the Workforce or an authorized, qualified operator as follows:

- A monthly inspection is performed on an elevating work platform if it has been continuously in service for 1 month.
- A quarterly inspection is performed for platforms that have been out-of-service for more than 3 months.
- An annual inspection is performed for all other elevating platforms that have not been subjected to the previous inspections.



- The following records are retained in an equipment history file or departmental files for 3 years:

- Copies of completed SF 2001-PEW, [Pre-Use Inspection Form: Elevating Work Platform \[Word file/Acrobat file\]](#), as appropriate.
- Certificates of training for [authorized, qualified operators](#).

- The following records are retained in an equipment history file or departmental files for the life of the elevating work platform:

- Documentation of pre-delivery preparation performed by the equipment supplier.
- Name and address of the manufacturer sorted by serial number and date of delivery.
- Copies of completed [SF 2001-IEW, Periodic Use Inspection Form: Elevating Work Platform \[Word file/Acrobat file\]](#).



Authorized, qualified operators shall:

- Use appropriate fall-protection equipment.

Note: Fall-protection equipment is required for operators using vehicle-mounted or boom-supported [elevating work platforms](#).

- Report any use of suspect parts or fasteners to **their managers**.
- Perform pre-use inspections, including a visual inspection and a functional test, before each use of elevating work platforms or at the beginning of each shift.
- Maintain a firm footing on the platform floor.
- **Not** use planks, ladders, or any other device for achieving additional height or reach.
- Before each movement of an elevating work platform and after repositioning it, verify that:
 - The elevating work platform is operated on a surface within the limits specified by the manufacturer.
 - The outriggers, stabilizers, extendible axles, or other stability enhancing means, are used as required by the manufacturer.
 - Guardrails are installed and access gates or openings are closed per manufacturer's instructions.
 - The load and its distribution on the platform and any platform extension are in accordance with the manufacturer's rated capacity for that specific configuration.
 - There is adequate clearance from overhead obstructions.
 - The Minimum Safe Approach Distance (MSAD) to energized power lines and parts for non-insulated platforms, as listed **below** are maintained.

Voltage Range (Phase-to-Phase)	MSAD
0 to 300 V	5 ft or 1.52 m
> 300 V to 50 kV	10 ft or 3.05 m
> 50 kV to 200 kV	15 ft or 4.60 m
> 200 kV to 350 kV	20 ft or 6.10 m

> 350 kV to 500 kV	25 ft or 7.62 m
> 500 kV to 750 kV	35 ft or 10.67 m
> 750 kV to 1,000 kV	45 ft or 13.72 m

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Activities requiring the use of personal protective equipment (PPE)	Section 4L , "Personal Protective Equipment (PPE)"
Electrical wiring or electrically-energized equipment	Section 4B , "Electrical Safety Practices"
Working alone	Section 4A , "Working in High-Injury-Potential/Remote Operations"
Working at heights	Section 4G , "Fall Prevention/Fall Protection"
Reporting suspect and counterfeit items or material occurrences	Section 18C , "Reporting, Investigating, and Correcting ES&H Events"

*REFERENCES

Requirements Source Documents

[29 CFR 1910.25](#), *Portable Wood Ladders*.

[29 CFR 1910.26](#), *Portable Metal Ladders*.

[29 CFR 1910.27](#), *Fixed Ladders*.

[29 CFR 1910.28](#), *Safety Requirements for Scaffolding*.

[29 CFR 1910.29](#), *Manually Propelled Mobile Ladder Stands and Scaffolds (Towers)*.

[29 CFR 1910, Subpart F](#), *Powered Platforms, Manlifts, and Vehicle-Mounted Work*

Platforms.

ANSI/SIA A92.2, *Vehicle Mounted Elevating and Rotating Aerial Devices.*

ANSI/SIA A92.5, *Boom-Supported Elevating Work Platforms.*

ANSI/SIA A92.6, *Self-Propelled Elevating Work Platforms.*

*Related Documents

[29 CFR 1926, Subpart L](#), *Scaffolds.*

[29 CFR 1926, Subpart X](#), *Ladders.*

ANSI A14.1, *Ladders - Portable Wood - Safety Requirements.*

ANSI A14.2, *Safety Requirements for Portable Metal Ladders.*

ANSI A14.3, *Safety Requirements for Fixed Ladders.*

ANSI A14.5, *Ladders - Portable Reinforced Plastic - Safety Requirements.*

SNL, CPR500.2.1, *Procurement Manual*, [Section 3.1.2.5](#), "Restricted Items Requiring Special Processes."

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ES&H Manual

SECTION 4H – EXCAVATIONS, TRENCHES, AND FLOOR OR WALL PENETRATIONS

Subject Matter Expert: [Andrew Zeitler](#); CA Counterpart: [Jay Larsen](#)

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* Indicates a substantive change

- [Applicability](#)
 - [*Excavation or Penetration Activities](#)
 - [Safety Precautions](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Forms:
 - SA 6610-EP, Excavation Permit ([Word file](#)/[Acrobat file](#))
 - SA 6610-PP, Penetration permit ([Word file](#)/[Acrobat file](#))
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who perform activities at [Sandia-](#)

[controlled premises](#) that require them to work in close proximity to [excavations](#), [trenches](#), or [floor or wall penetrations](#).

*EXCAVATION OR PENETRATION ACTIVITIES

*Requirements

Managers who are responsible for excavation or penetration activities shall ensure that:

- Adequate oversight of Members of the Workforce and their activities is provided to ensure all coring and sawing activities are performed in accordance with contract requirements.
- Excavation or penetration activity oversight is clearly identified and performed by a competent person.

Note: For purposes of this document, a competent person is defined as one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to Members of the Workforce, and who has authorization to take prompt corrective measures to eliminate them.

- Incidents or events associated with excavation or penetration activities are reported to the ES&H Performance Assurance Department in accordance with [Section 18C](#), "Occurrence Reporting."

Managers shall work with [Sandia contracting representatives](#) to ensure that the language in contracts associated with excavation or penetration activities require [contractors](#) to:

- Designate a competent person for excavation activities.
- Perform the following before conducting excavation or penetration activities:
 - Review drawings of the site where excavation or penetration activities are to take place for the possible existence of concealed utilities.

- Conduct a site investigation.
- Conduct an electronic detection on all utilities in poured concrete structures containing rebar.
- Post and maintain warning signs where electrical circuits exist.
- Ensure all workers performing penetration or excavation activities are advised of the location of electric power circuit lines, the hazards involved, and the protective measures to be taken.
- Hazards are identified and communicated to workers using the appropriate Sandia excavation or penetration permit.

● Obtain the following types of Sandia excavation or penetration permits from their [Division ES&H Team](#) before performing work:

- SA 6610-PP, Penetration Permit ([Word file](#)/[Acrobat file](#)) for:
 - Penetration activities into concrete slabs, floors, ceilings, roofs, or walls greater than 2 inches (does not include concrete sidewalks).
 - **All** penetrations into underground concrete duct banks.
 - **All** penetrations in which a site investigation cannot identify possible hidden hazards.
- SA 6610-EP, Excavation Permit ([Word file](#)/[Acrobat file](#)) for:
 - Digging, saw cutting, drilling, coring, or trenching into:
 - Soil, concrete sidewalks, or asphalt to a depth greater than 12 inches.
 - Soil beneath concrete sidewalks or asphalt.
 - Excavation review (see SA 6610-EP ([Word file](#)/[Acrobat file](#)), Excavation Permit).

- Excavation into subsurface soil in buildings beneath slabs.
- Scraping, blading, or excavating for:
 - Any area previously undisturbed or appears to be undisturbed (i.e., areas covered with native vegetation).
- At SNL/CA, a Sandia California facility safety permit.

Note: See [Section 4V](#), “Construction and Construction-Like Activities,” for requirements pertaining to the review of trenches and excavations.

- Improvements to previously unimproved roads or paths.
- Wear the following [personal protective equipment \(PPE\)](#) in work areas where the exact locations of underground electrical circuits are unknown and in which the excavation or penetration activities may encounter such electrical energy sources:
 - Approved 600V-rated gloves
 - Eye protection
 - Electrically-rated boots

Note: See [Section 4N](#), “Industrial Machine and Portable Power Tool Safety,” and [Section 4L](#), “Personal Protective Equipment (PPE),” for additional information on PPE requirements.

- Ensure all tools used in coring or sawing are double insulated and/or properly grounded, and all tools are protected by a ground fault circuit interrupter (GFCI).
- Perform [excavation](#) and penetration activities with caution.

Guidance

Members of the Workforce should contact their [Division ES&H Team](#) for more information about excavation or penetration activities.

SAFETY PRECAUTIONS

Requirements

Members of the Workforce shall:

- Obey all [barricades](#), flagging, warning lights, and signs associated with [excavations](#), [trenches](#), or [floor or wall penetrations](#).
- Follow any indicated detours.
- Obtain a Sandia excavation or penetration permit from their [Division ES&H Team](#) before performing excavations or penetrations (see [AP-004](#), *Excavation or Penetration Activities Procedure*).
- **Not** dispose of anything in an excavation, trench, or floor or wall penetration.

Guidance

Members of the Workforce should:

- Avoid being in or around excavations, trenches, or floor or wall penetrations unless their work activities require them to be there.
- Consult the [excavations, trenches, and floor and wall penetrations contact](#) or their [Division ES&H Team](#) for assistance when required to excavate, dig trenches, or penetrate floors or walls.

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Construction and construction-like work	Section 4V , "ES&H for Contracted Construction and Construction-Like Activities."

 Portable power tools[Section 4N](#), "Industrial Machine and Portable Power Tool Safety."

Electrical work

[Section 4B](#), "Electrical Safety Practices."

REFERENCES

Requirements Source Documents

[29 CFR 1926](#), *Safety and Health Regulations for Construction*, Subpart K, "Electrical."

[29 CFR 1926](#), *Safety and Health Regulations for Construction*, Subpart P, "Excavations."

[DOE 5480.4, Chg. 4](#), *Environmental Protection, Safety, and Health Protection Standards*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

ANSI Z87.1-1989, *Practice for Occupational and Educational Eye and Face Protection*.

ANSI Z41-1999, *User Guide and Protective Footwear Standard Combination Set*.

SNL, [Section 4V](#), *ES&H for Contracted Construction and Construction-Like Activities*.

SNL, [AP-004](#), *Excavation or Penetration Activities Procedure*.

Related Documents

ANSI Z535.2-1991, *Environmental and Facility Safety Signs*.

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SECTION 10T - SURFACE AND STORM WATER DISCHARGES

Subject Matter Experts: [Charles Fink](#), [Adrian Jones](#); CA Counterpart: [Robert Holland](#)
MN471001, Issue D
Revision Date: [January 26, 2004](#); Replaces Document Dated: August 5, 2003

* Indicates a substantive change



- [Applicability](#)
 - [Surface Water Discharges](#)
 - [Storm Water Discharges](#)
 - [Unplanned/Unallowed Discharges](#)
 - [*Building Design, Modification, and Maintenance](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:



- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities on [Sandia-controlled premises](#) at SNL/NM and SNL/CA.

SURFACE WATER DISCHARGES

Requirements

SNL/NM personnel shall obtain approval to [discharge](#) to the surface from the Environmental

Management Department (3121) prior to any such discharge. All requests to discharge shall include volume, frequency, location, pH, chemical composition, and a description of the process associated with the discharge.

SNL/CA personnel shall **not** discharge to the surface or to the [storm water](#) system at SNL/CA. For information, call the [Water Quality](#) contact.

Guidance

Managers should retain copies of all approvals for [discharge](#).

STORM WATER DISCHARGES



Requirements

At SNL/NM, Members of the Workforce shall obtain written approval from the Environmental Management Department (3121) before discharging [storm water](#) that has been collected in secondary containment to the storm drain system. The preferred method of dealing with storm water in secondary containment is to allow it to evaporate because draining secondary containment structures entails the risk of releasing contaminated water to the environment.

At SNL/CA, Members of the Workforce shall **not** [discharge](#) to the surface or to the storm water system at SNL/CA. For information, call the [Water Quality](#) contact.

UNPLANNED/UNALLOWED DISCHARGES



Requirements

Members of the Workforce shall immediately report all unplanned [discharges](#) (no matter how small and no matter what the discharged substance is) to the surface or to the [storm water](#) system according to requirements in [Section 18E](#), "Environmental Release Reporting".

If an unallowed discharge (either solid or liquid) takes place, Members of the Workforce shall follow the requirements and guidance in [Section 10E](#), "Chemical Spills."

Also see [Chapter 15](#), "Emergency Preparedness and Management," for information about handling unplanned events.

Guidance



Members of the Workforce may discharge water from secondary containment for oil storage structures if it meets the conditions of [Section 10F](#), "Oils, Greases, and Fuels."

See [Section 10E](#), "Chemical Spills," for details on chemical spill response. See [Section 18E](#), "Environmental Release Reporting," for instructions for reporting an environmental release.

*BUILDING DESIGN, MODIFICATION, AND MAINTENANCE

Requirements

Members of the Workforce involved in building design, modification, or maintenance activities shall:

At all sites:

- Ensure that the storm water drainage systems in new buildings are designed to comply with current plumbing codes (which comply with the Clean Water Act).
- When connecting to external underground drainage pipes, ensure that only storm drains are tied into the storm water drainage system. **Never** connect floor drains to the storm water drainage system.
- When removing water from utility manholes ensure that modifications to existing building drains are connected to the proper drainage system and comply with current plumbing codes. Only [storm water](#) and air conditioning condensate water are allowed to be plumbed to the storm water drainage system.
- Cooling tower water and evaporative cooling blowdown water shall **not** be discharged to the storm water drainage system. These cooling waters may be discharged to the surface if both of the following criteria are met:
 - These waters have **not** been treated with any type of chemicals.
 - Written approval is obtained from the Environmental Management Department (3121) or the Environmental Operations Department (8516).

At SNL/NM:

- Ensure that projects that will disturb an area of soil that is equal to or greater than 1 acre, including staging areas, have a National Pollutant Discharge Elimination System (NPDES) permit for discharging storm water from construction activities.
- [Notify the Environmental Management Department \(3121\) of the need for a permit prior to any contact with the EPA.](#)



- Ensure that when removing water from utility manholes, this water is [discharged](#) to the surface or sanitary sewer after receiving written approval from Department 3121.

At SNL/CA:

- Ensure that all construction projects implement storm water best management practices. Consult the [Environmental Monitoring](#) contact for more information about best management practices.
- When removing water from utility manholes, this water is discharged to the sanitary sewer.

RELATED HAZARDS AND ACTIVITIES




Hazard/Activity	Reference
Environmental release reporting	Section 18E , "Environmental Release Reporting."

REFERENCES

Requirements Source Documents

[40 CFR 122](#), *EPA National Pollutant Discharge Elimination System Permit Regulations*.

 California State Water Resources Control Board, *General Industrial Activities Storm Water NPDES Permit*, Water Quality No. 97-03.

New Mexico Administrative Code (NMAC), Title 20 *Environmental Protection*, Chapter 6 Water Quality.

Implementing Documents

Note: The following brochures are available either from the Environmental Management Department (3121) or the Environmental Operations Department (8516):

SNL, *Only Rain in the Storm Water Drain*.

SNL, *Water Quality at Sandia National Laboratories*,.

Related Documents



10 CFR 834, *Radiation Protection of the Public and the Environment*.

33 USC 1251 et. seq., *Clean Water Act of 1977*.

40 CFR 123, *EPA Regulations on State NPDES Permit Program Requirements*.

40 CFR 125, *EPA National Pollutant Discharge Elimination System Regulations*.

City of Albuquerque Groundwater Protection Policy, *Albuquerque/Bernalillo County Ground Water Protection Policy and Action Plan*.

City of Livermore Ordinance, Chapter 13.45, *Stormwater Management and Control Program*.

California Storm Water Quality Task Force, *California Storm Water Best Management Practices Handbook for Industrial/Commercial*.

California Storm Water Quality Task Force, *California Storm Water Best Management Practices Handbook for Construction Activity*.

[DOE Order 5400.5](#), *Radiation Protection of the Public and the Environment*.

EPA 832-R-92-006, *Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices*.

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Corporate Process Requirement No: CPR400.1.1
Sponsor: Dori Ellis, 4000, Acting

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IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

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CHAPTER 10 – ENVIRONMENTAL PROTECTION

MN471001, Issue AT

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- [Section 10A](#) - Pressurized Drums
- [Section 10B](#) - National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties
- [Section 10C](#) - Migratory Birds, Protected Species, and Other Biota
- [*Section 10D](#) - Polychlorinated Biphenyl (PCB) Management
- [Section 10E](#) - Chemical Spills
- [Section 10F](#) - Oil and Fuel Storage
- [Section 10G](#) - Potable Water
- [Section 10H](#) - Discharges to the Sanitary Sewer System
- [Section 10J](#) - Registering, Naming, and Labeling Bulk Storage Tanks
- [Section 10K](#) - Underground Storage Tanks
- [Section 10L](#) - Management of Excess Metallic Lead
- [Section 10N](#) - Discovering and Reporting a Potential Past Waste Release Site
- [Section 10T](#) - Surface and Storm Water Discharges

- [Section 10U](#) - Scrap Metal From a Radiological Area or Volumetrically Contaminated Metal
-

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ES&H Manual


ATTACHMENT 4L-1 – EYE AND FACE PROTECTION RECOMMENDATIONS




Subject Matter Expert: [Jared Mowrer](#); CA Counterpart: [Jay Larsen](#)Contributor: [Lisa Hooper](#)

MN471001, Issue K

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Review: September 19, 2003

Condition	Activities such as . . .	That produce . . .	Require one of the following . . .
 Impact	<ul style="list-style-type: none"> ● Chipping ● Grinding ● Masonry work ● Chiseling ● Riveting ● Sanding 	Hazards such as flying: <ul style="list-style-type: none"> ● Fragments ● Objects ● Large chips ● Particles ● Sand 	<ul style="list-style-type: none"> ● Safety glasses with side protectors ● Goggles ● Face shields worn over safety glasses or goggles (for severe exposure) See Notes (a) (c) (d) (e) (f)

		<ul style="list-style-type: none"> • Dirt 	
<p>Heat</p>   	<ul style="list-style-type: none"> • Furnace operations • Pouring molten metal • Casting metals • Hot dipping • Gas cutting • Welding • Electrical work 	<ul style="list-style-type: none"> • Hot sparks • Splashes from molten metals • High-temperature exposure 	<ul style="list-style-type: none"> • Faceshields, goggles, spectacles <p>See Notes (b) (c)</p> <ul style="list-style-type: none"> • Faceshields worn over goggles (for severe exposure) <p>See Notes (b) (c)</p> <ul style="list-style-type: none"> • Screen faceshields • Reflective faceshields <p>See Notes (b) (c)</p>

Chemical

- Handling cryogenic material

- Splashes
- Pressurized sprays

- Safety glasses with side protectors
- Face shield over safety glasses

- Corrosive and chemical handling
- Material handling
- Degreasing
- Plating

- Splashes

- Goggles, eyecup and cover types
- Face shields worn over safety goggles (for high splash potential)
- Special purpose goggles

Dust

- Woodworking
- Buffing and sanding
- General dusty

- Nuisance dust

- Goggles, eyecup and cover types



	conditions	
Optical radiation	<ul style="list-style-type: none"> • Welding (arc and gas) • Cutting • Torch brazing and soldering 	For optical radiation PPE, see Table 4E-3 and Attachment 4E-3 in Section 4E , "Hot Work Safety."

Notes:

- a. Care shall be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards must be provided.
- b. Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.
- c. Faceshields shall only be worn over primary eye protection.
- d. Persons whose vision requires the use of prescription (Rx) lenses shall wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
- e. Wearers of contact lenses shall also be required to wear appropriate covering eye and face protection devices in a hazardous environment. It

should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.

f. Non-sideshield spectacles are available for frontal protection only.



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SECTION 6L – EATING AND DRINKING

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* Indicates a substantive change

- [Applicability](#)
 - [Eating and Drinking](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to eating and drinking in locations at [Sandia-controlled premises](#).

EATING AND DRINKING

Requirements

Members of the Workforce shall not consume food or beverages in a [toilet room](#) or in any area exposed to a [toxic material](#).

Guidance

Members of the Workforce should avoid eating, drinking, smoking, gum chewing, or applying cosmetics in areas where laboratory chemicals are present, and should wash their hands before conducting these activities. Members of the Workforce should avoid:

- Storing food or beverages in storage areas or refrigerators that are also used for chemical laboratory operations.
- Handling or consuming food or beverages using glassware or utensils which are also used for chemical laboratory operations.

Members of the Workforce should contact their [Division ES&H Team](#) for additional guidance.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Health and safety plans	Chapter 21 , "Technical Work Documents (TWDs)"
Responding to accidents and injuries	Chapter 16 , "Health, Benefits, and Employee Services"
Chemical hazards	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"

*REFERENCES



Requirements Source Documents

[29 CFR 1910.141](#), *Sanitation*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.



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ES&H Manual

*SECTION 6J - NONIONIZING RADIATION

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- [Applicability](#)
 - [*Exposure Controls](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to all [Members of the Workforce whose activities have the potential to result in an exposure to nonionizing radiation \(NIR\)](#), except for those activities using the following sources of NIR:

- Microwave ovens used for heating food
- Hand-held radios used for telecommunications
- Video display terminals (VDTs) like those used for computers and televisions
- Lasers
- Indoor/outdoor lights



*EXPOSURE CONTROLS

Requirements

At SNL/CA, owners of [NIR](#) sources shall ensure that radiofrequency and microwave sources are surveyed at least once a year to:

- Identify leakage.
- Determine or re-verify safe operating boundaries or zones.



Managers of activities involving [nonionizing radiation \(NIR\)](#) shall ensure that:

- Exposure of Members of the Workforce to nonionizing radiation is below applicable exposure limits as defined in *1997 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices*, or the latest edition. (Managers who do not have access to this document may contact their [Division ES&H Team](#) to obtain this information.)
- Members of the Workforce lockout/tagout NIR and related equipment when working within the hazard zone of an NIR source and NIR-related power sources (see [GN470037](#), *Lockout/Tagout Procedure for the Control of Hazardous Energy*, for more information).

Managers of activities that involve radio frequency devices shall ensure that:



- Warning signs are posted around radio frequency devices and antennas operating at frequencies between 30 kHz and 300 GHz that emit fields into occupied or potentially occupied areas having strengths greater than the frequency based exposure limit.
- Other warning or precautionary instructions, appropriate for the specific system operated and its operating environment, appear in the lower portion of the warning sign.
- Signs be posted at the barrier or boundary surrounding such devices, or at a distance where personal exposure of a worker or member of the general public would be less than the exposure limit for the operating frequency.

- Radio frequency warning signs comply with content, color, and dimension requirements stated in 29 CFR 1910.97. (This sign is available from JIT through Fisher Scientific [catalog number NC9640447, past part number ACCRF001PBA]).

Managers shall ensure that specific warning symbols or signs, when posted around the following devices, comply with ANSI Z53.1-1979:

- Operating at frequencies less than 30 kHz that emit fields into occupied or potentially occupied areas having strengths greater than the frequency based exposure limit.
- That emit ultraviolet, visible, or infrared light energy into occupied or potentially occupied areas at energy densities that meet or exceed appropriate exposure limits.

Guidance

Operating sources of NIR, which release (intentionally or unintentionally) energy in the vicinity of occupied areas at levels in excess of the applicable exposure limits, may create a health risk. The degree of potential health risk depends on the frequency and power density of the NIR and duration of exposure. Members of the Workforce should contact their [Division ES&H Team](#) for additional information on NIR and evaluation of new and existing NIR sources.

Managers should implement [technical work documents \(TWDs\)](#) where NIR sources have the potential to expose Members of the Workforce to NIR at levels approaching or equivalent to existing exposure limits. **Such TWDs should provide details on the**

administrative methods (i.e., exposure time limits) and PPE (i.e., gold coated goggles or face shields) used to control worker exposure to NIR at levels above the applicable exposure limits.

Note: TWDs may be written using the guidance provided by [Chapter 21](#), "Technical Work Documents (TWDs)."

Managers should post appropriate, specific warning symbols or signs around devices that:

- Operate at frequencies less than 30 kHz that emit fields into occupied or potentially occupied areas having strengths greater than the frequency based exposure limit.
- Emit ultraviolet, visible, or infrared light energy into occupied or potentially occupied areas at energy densities that meet or exceed appropriate exposure limits.

Note: Postings should be placed at the barrier or boundary surrounding these devices, or within the occupied or potentially occupied area at a distance where worker exposure would be less than the exposure limit for the wavelength emitted by the light source.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [nonionizing radiation \(NIR\)](#) include:

Hazard/Activity	Reference
Lockout/Tagout of NIR and related equipment	Section 4C , "Lockout/Tagout and Administrative Control Locking"
Electrical work	Section 4B , "Electrical Safety Practices"

REFERENCES

Requirements Source Documents

[29 CFR 1910.97](#), *Nonionizing Radiation*.

American Conference of Governmental Industrial Hygienists (ACGIH), *1997 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices*, Cincinnati, OH, 1997 or latest edition.

[DOE 5480.4](#), *Environmental Protection, Safety, and Health Protection Standards*.

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.



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ATTACHMENT 15-1 – WHAT TO DO DURING AN EMERGENCY

Subject Matter Expert: [Carol V. Bonney](#); CA Counterpart: [Judy Acosta](#)

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APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in Section 1B, "What Is the Scope."

This attachment applies to all Members of the Workforce at Sandia-controlled premises and provides instructions on what to do for various types of emergencies with the exception of medical emergencies and radiological incidents. For instructions on what to do during a medical emergency, see [Chapter 16](#), "Health, Benefits, and Employee Services" For instructions on what to do during a radiological incident, see CPR400.1.1.32/ [MN471016](#), "Radiological Protection Procedures Manual," [Chapter 11](#), "Radiological Incidents." Members of the Workforce working or visiting at sites other than at Sandia-controlled premises shall be aware of and follow the emergency procedures for the host site.

Requirements

Members of the Workforce shall follow:

- Actions, as appropriate for the specific type of emergency listed **below**:

Note: Select the appropriate link below to be directed to the correct table.

- [Fire](#)
- [Chemical Spill or Hazardous Material Release](#)
- [Bomb Threat](#)
- [Natural Phenomena Emergencies](#)
- [Workplace Violence](#)
- [Suspicious and Unattended Items](#)
- [Power Outage](#)

- Common actions under the table entitled, "During Any Emergency or if Instructed to Evacuate."

During Any [Emergency](#) or if Instructed to Evacuate

Step	Action
1	Alert others and pull the nearest fire alarm, except in the case of a bomb threat or if instructed not to do so. Note: Always take alarms seriously; never assume any alarm is false.



2

If the situation warrants, and it is:

- Feasible and safe to do so:
 - Shut down operations involving hazardous material or electrical equipment.
 - Secure classified matter or take it with you.
 - Take your keys and personal items.
- **Not** feasible and safe, or if time does not permit you to do so:
 - Leave operations on.
 - Leave classified matter behind (see [Step 6](#), for further instructions).

Note: The health and safety of personnel take precedence over the need to shut down equipment or secure classified matter.

3

Leave the building/danger area via the nearest safe exit/route.

Note: Persons who are unable to use stairs should take refuge within the nearest enclosed stairway or designated area of refuge and wait for assistance by [emergency response personnel](#). Do not attempt to evacuate persons who have taken refuge within an enclosed stairway.



4

From a safe location, call 911 or the site [emergency number](#).


5

Go directly to the designated assembly area or other safe location (as instructed).


Note: Stay close, do not leave the area, and listen for further information as it becomes available.


 <p>6</p>	<p>Report immediately to a Security Officer or the Incident Commander if you:</p> <ul style="list-style-type: none"> • Have information regarding the cause of the emergency. • Were not able to terminate hazardous operations before evacuating. • Are a member of the building evacuation team. • Have knowledge of anyone in the building in need of evacuation assistance. • Are carrying classified matter. • Left classified matter unattended or left a vault-type room (VTR) unsecured.
 <p>7</p>	<p>Do not re-enter the building until authorized to do so by emergency response personnel.</p> <p>Note: If you left classified matter unattended, you will be allowed to reenter the area before the other building occupants. Be sure to inspect unsecured classified matter as soon as building re-entry is allowed.</p>



Fire	
Step	Action
1	<p>If the fire is small and incipient, you may try to extinguish it with the proper type of fire extinguisher. Remember that smoke from fires is toxic and causes most fire deaths.</p> <p>Note: Do not jeopardize your personal safety.</p>




2	<p>If you cannot extinguish a fire, evacuate the area.</p> <p>Note: Remember to test all doors before opening. Do not open a hot door.</p>
3	<p>From a safe location, call 911 or the site emergency number.</p>

 Chemical Spill or Hazardous Material Release	
Step	Action
1	<p>Determine whether the situation is an emergency or non-emergency, and call the appropriate number for your site. See Section 10E, "Chemical Spills," for more information.</p>
2	<p>Evacuate the immediate area and stay upwind.</p>

Bomb Threat	
Step	Action
 1	<p>Ask the person making the threat:</p> <ul style="list-style-type: none"> ● Where is the bomb located? ● When will it go off? ● What does the bomb look like? ● What type of explosive?

 <p>2</p>	<p>Note the following:</p> <ul style="list-style-type: none"> • Was the person male or female, adult or juvenile? • What exactly did the person say? • Was the person's speech slow, excited, distinctive, slurred, fast, accented, or stuttered? • Was there background noise such as music, horns, traffic, crowds, machinery, trains, airplanes, vehicles, animals?
<p>3</p>	<p>After receiving the bomb threat, call the "bomb threat" or your site emergency number and follow all instructions.</p>
 <p>4</p>	<p>Do not pull the building fire alarm.</p>

Natural Phenomena Emergencies

Step	Action
<p>1</p>	<p>In the event of:</p> <ul style="list-style-type: none"> • Severe weather (e.g., lightning, high winds), remain indoors and advise others to remain indoors. If outdoors, seek shelter and advise others to seek shelter. Move to the basement if applicable. • An earthquake, move to the center of the building or take cover under sturdy furniture (e.g., a desk or work table). If outdoors, move to an open area away from buildings, utility wires, and trees.
 <p>2</p>	<p>Do not use elevators.</p>
<p>3</p>	<p>Stay away from windows, glass doors, display cabinets, bookcases, or other heavy items that could be toppled.</p>

Workplace Violence

Step	Action
1	If you have a workplace violence concern, report the situation to 311 or 844-6515 (SNL/NM) or the site non-emergency number , or to any member of management.
2	If you observe or experience workplace violence, call 911 or the site emergency number and report the incident.

Suspicious and Unattended Items

Action

Call **911** or the site [emergency phone number](#) if:

- You receive a suspicious package (e.g., unknown or missing return address).
- You notice an unattended package (e.g., backpack, briefcase, lunch box).

Power Outage

Step	Action
1	If you are in an unlighted area, go cautiously to an area that has emergency lights. If applicable, open window shades or blinds.
2	If you are in an elevator, use the intercom, telephone, or emergency button to alert emergency response personnel.
3	If possible, call 311 or non-emergency phone number to report the outage.
4	If possible, turn off power to equipment and appliances to prevent circuit overload and possible equipment damage when power is restored.



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ES&H Manual

*SECTION 6V - ERGONOMICS

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- [Applicability](#)
- [*General Ergonomics](#)
- [*Office Ergonomics](#)
- [*Related Hazards and Activities](#)
- [*References](#)
- Attachments
 - [*6V-1](#) - The Dynamic Office
 - [*6V-2](#) - Workstation Design
 - [*6V-3](#) - Recommended Working Postures
 - [*6V-4](#) - Ergonomic Chairs
 - [*6V-5](#) - Typing Positions for Arms, Wrists, and Hands
 - [*6V-6](#) - Using Video Display Terminals (VDTs)
 - [*6V-7](#) - Guidelines for Workstation Equipment and Accessories

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to activities involving work in an office environment on [Sandia-controlled premises](#).




GENERAL ERGONOMICS

Requirements

Managers shall provide Members of the Workforce with a workplace in which [musculoskeletal stressors](#) have been anticipated, identified, evaluated, and controlled when they pose a [health hazard](#).

Members of the Workforce shall verbally report all occupational injuries/illnesses, including musculoskeletal stressors, to their manager as soon as possible (see "Reporting Injuries and Illness," [in Chapter 16](#), "Health, Benefits, and Employee Services").

Guidance



Members of the Workforce and/or managers should contact their [Division ES&H Team](#) for assistance in identifying, evaluating, and controlling musculoskeletal stressors. For information on office ergonomics, see [Section 6V](#), "Ergonomics."

OFFICE ERGONOMICS

Requirements

Managers shall notify the [Occupational Medicine Programs Team](#) contact when Members of the Workforce report any work-related discomfort or chronic pain.

Members of the Workforce shall report any work-related pain or symptoms to their

manager.

Guidance

Managers should:

- Identify hazards in the office environment and contact one of the following for assistance in the analysis or redesign of workspaces:
 - [Division ES&H Team](#)
 - [Ergonomic Coordinator](#) contact
 - [SNL/CA ES&H Hotline](#)
- Respond to worksite evaluation recommendations within 30 days (SNL/NM only).
- Retain copies of any worksite evaluation recommendations, as well as any responses to the recommendations, for at least one year. A 3-year retention period is recommended to correspond to the standard corporate records retention schedule.
- Where appropriate, provide the furniture and equipment to implement recommendations resulting from a worksite evaluation.

Members of the Workforce should:

- Contact their [Division ES&H Team](#) for advice on ergonomic issues.
- Avoid prolonged sitting, strained or awkward wrist positions, and allowing eyes to become overly fatigued.
- Be familiar with the Dynamic Office concept as presented in [Attachment 6V-1](#).
- Be familiar with the workstation design concepts presented in [Attachment 6V-2](#).
- Seek advice on [ergonomics](#) issues from one of the following:
 - [Division ES&H Team](#)

- [Ergonomic Coordinator](#) contact

- [SNL/CA ES&H Hotline](#)

- **Not** limit their working posture to the traditional erect sitting posture. See [Attachment 6V-3](#) for suggested alternatives.

Members of the Workforce who work at video display terminals (VDTs) should:

- Consider the advantages of an ergonomic chair. See [Attachment 6V-4](#) for more information about ergonomic chairs, including selection criteria and adjustment techniques.
- Use accepted techniques to avoid [cumulative trauma disorders \(CTDs\)](#). See [Attachment 6V-5](#) for more information about CTDs and the appropriate use of keyboards.
- Adjust video display terminals (VDTs) to avoid vision problems. See [Attachment 6V-6](#) for more information on the proper use of VDTs.
- Select and use workstation equipment and accessories in an appropriate manner. See [Attachment 6V-7](#) for more information about workstation equipment and accessories, including selection criteria and techniques for using such items.

*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to office [ergonomics](#) include:

Hazard/Activity

Office [ergonomics](#) at SNL/CA
Office safety

Reference

[MN471019](#), *SNL/CA Office ES&H Manual*
[Chapter 3](#), "Office Safety"

*REFERENCES

Requirements Source Documents

[29 CFR 1904.2](#), *Log and Summary of Occupational Injuries and Illnesses*.

*Implementing Documents

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

ANSI/BIFMA X5.1-1993, *Office Furnishings-General Purpose Office Chairs-Tests*.

ANSI/HFS 100-1988, *Human Factors Engineering of Visual Display Terminal Workstations*.

[DOE 5483.1A](#), *Occupational Safety and Health Program for DOE Contractor Employees at Government Owned Contractor-Operated Facilities*.



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ES&H Manual

*SECTION 19C – MIXED WASTE MANAGEMENT

Subject Matter Expert: [Phil Zelle](#); CA Counterpart: [Leighton Ford](#)

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* Indicates a substantive change

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- [19C-4](#) - Illustration of Waste Parcel

- Forms

- SF 2042-NCA, SNL Nonconformance Corrective Action Report Form ([Word file](#))
- SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([Website](#))



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who are involved in activities on [Sandia-controlled premises](#) which generate [mixed waste](#).

Note: For additional information regarding management of mixed waste at SNL/CA, see CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, and contact the SNL/CA [radioactive and mixed waste operations contact](#).

For purposes of this document, DOE and NNSA are synonymous.

For purposes of this document, Satellite Accumulation Points (SAPs) and Satellite Accumulation Areas (SAAs) are synonymous.

Exemptions

This section does **not** apply to:

- Material that is undergoing testing or evaluation, or that still has a defined use and is kept in good working condition. As such, this material is not yet waste as defined by the Resource Conservation and Recovery Act (RCRA) or state



regulations.

- [Hazardous waste](#) that meets the criteria in [Attachment 19B-1](#), "Release of Non-Radioactive Waste."

Note: The exemptions for naturally occurring radioactive material and for consumer products, as discussed in [Attachment 19B-1](#), "Release of Non-Radioactive Waste," do not apply to SNL/CA.

TRAINING

Work Activity or Role	Required	Recommended
Primary waste generator (NM)	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once), * ENV252 (every 2 years)	N/A
Secondary waste generator (NM)	(See the Requirements and Guidance sections below this table)	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once)
Primary waste generator (CA)	ENV112CA (annually), RAD210 or RAD230 (every 2 years), ENV189CA (every 2 years)	
Secondary waste generator (CA)	(See requirements and guidance sections below this table.)	ENV112CA (annually), RAD210 or RAD230 (every 2 years), ENV189CA (once)

ES&H coordinator and environmental protection representative involved with mixed waste (NM)	N/A	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once)
Project leaders involved with mixed waste (NM)	N/A	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once)
Members of the Workforce involved in the management of a less-than-90-day accumulation area (NM)	ENV216 (annually) or equivalent	N/A
*ENV252 is a refresher of ENV189 that is required every 2 years.		

Requirements

[Primary waste generators](#) shall train secondary waste generators on [mixed waste](#) management requirements that are applicable to their projects and document this training in organizational files.

Guidance

[Primary waste generators](#) are encouraged to provide and document periodic training to secondary waste generators regarding waste management requirements and issues.

WASTE MINIMIZATION



Note: Sandia follows a waste minimization hierarchy:

- Material should be reduced or eliminated at the source.
- If material cannot be reduced or eliminated at the source, material should be reused or recycled.

- If material cannot be reduced or eliminated at the source, reused, or recycled, then consult the appropriate [Division ES&H Team](#) environmental protection representative for additional information on waste minimization and waste management.

Requirements

[Primary waste generators](#) shall:

- 
- Integrate methods into their daily work operations to minimize the generation of [mixed waste](#) and other waste.
 - Evaluate the following activities to minimize waste:
 - Minimize material use. Consider processes or material modifications that could eliminate or reduce the generation of waste. These changes can often be justified when the cost of waste management and disposal is considered for the life of the project or process.
 - Limit the introduction and use of chemicals in [radioactive waste](#) - generating processes and in Radioactive Material Management Areas ([RMMAs](#)). Consider processes or chemical modifications that could eliminate or reduce the generation of mixed waste.
 - Identify the least toxic or hazardous material that meets the design or process requirement.
 - Encourage vendors to provide material in reusable or returnable forms.
 - Recycle, reuse, and reclaim chemicals, material, and equipment. Consider the [Chemical Exchange Program](#) before purchasing or disposing of unused chemicals.
 - Decontaminate material and equipment.
 - Document waste minimization efforts.
- 

Guidance

[Primary waste generators](#) should consult the [Pollution Prevention Program contact](#) for methods of minimizing [mixed waste](#) generation in specific processes and for information on [pollution prevention opportunity assessments](#).

PLANNING AND PREPARATION

Requirements

[Primary waste generators](#) shall plan and manage [mixed waste](#) in accordance with [PG470228](#), *SNL Radioactive Waste Management Basis*, appropriately as follows:

- Prepare a [technical work document](#) (TWD) that addresses how mixed waste will be managed.

Note: For additional information, see the following:

- [Chapter 21](#), "Technical Work Documents (TWDs)."
- CPR400.1.1.32../mn471016, *Radiological Protection Procedures Manual*, [Chapter 1](#), "Radiological Work Planning and Controls."
- Ensure that the TWD addresses the following, at a minimum:
 - Waste characterization, including process knowledge information, and sampling and analysis planning, as applicable.
 - Establishment of a Radioactive Material Management Area ([RMMA](#)) to control activities or processes for which a reasonable potential exists of causing radioactive contamination or activation of material that may become waste. See [Section 19D](#), "Radioactive Material Management Areas (RMMAs)."
 - Mixed waste accumulation area.
 - Waste containers and labels, and packaging waste in containers.

- Segregation and control of mixed waste to maintain [traceability](#) of the [waste parcel](#).
- The preferred treatment or disposal site option.



Note: See relevant [subsection](#) for additional information about the items above.

- Reference Section 19C, “Mixed Waste Management,” in the TWD and state that the requirements in Section 19C of the *ES&H Manual* shall be followed.
- Meet any other applicable packaging and labeling requirements described in [POL 95-01](#), *Programmatic Waste Acceptance Criteria (WAC)*, for an onsite storage facility that is operated by the SNL Regulated Waste/Nuclear Material Disposition Department ([RWNMDD](#)).

Note: Consult the [radioactive and mixed waste operations](#) contact or the [waste certification official](#) for assistance with determining other applicable requirements.

- Write a request to the [permission to generate mixed waste contact](#) that describes:
 - The physical, chemical, and radiological characteristics of the mixed waste to be generated by a process, to enable a determination whether a treatment and disposal pathway exists for the waste.
 - An annual forecast of the volume of the mixed waste to be generated.
- Ensure that the above request for permission to generate mixed waste is:
 - Reviewed and approved by the permission to generate mixed waste contact before mixed waste is generated. For SNL/CA, the **Vice President** must **also** approve the generation of mixed waste.
 - Revised and resubmitted to the permission to generate mixed waste contact if there is a modification to the process that would change the waste form, the hazardous constituents in the waste, the annual generation volume of the mixed waste, or the location where the mixed waste is generated.




- Implement the requirements in “[Wastes With No Disposal Path](#),” and in

attachment 19C-1, "Approval Request Process for Mixed Waste With No Disposal Path," if it is determined that the waste has no disposal path.

If mixed [transuranic waste](#) will be generated, the primary waste generator shall consult the [transuranic waste management contact](#) to determine requirements regarding packaging, venting, and prohibited items.

Guidance

[Primary waste generators](#) should:

- 
- Consult the appropriate [Division ES&H Team](#) environmental protection representative before waste is generated, to resolve questions regarding [mixed waste](#) planning, accumulation, packaging, segregation, control, and characterization.
 - Adequately, plan operations and characterize mixed waste such that treatment and/or disposal of mixed waste can occur within one year after the waste is picked up by the RWNMDD.


WASTE CHARACTERIZATION - PROCESS KNOWLEDGE



Requirements


[Primary waste generators](#) shall:

- Characterize [mixed waste](#) to permit proper segregation, treatment, storage, and disposal.
- Ensure that the physical, chemical, and radiological characteristics of the mixed waste are documented.
- Document process knowledge for the mixed waste as the first step in waste characterization.




Note: Consult the appropriate [Division ES&H Team](#) environmental protection representative or the [waste characterization project leader](#) for assistance in documenting process knowledge information. At SNL/CA, also see CPR400.1.1.37/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, and consult the appropriate Division ES&H Team Environmental Protection Representative for information on additional [hazardous wastes](#) that are regulated by the state of California.

Note: When process knowledge relies on living memory, the individual's knowledge shall be documented and signed by both the interviewer and the interviewee. For telephone interviews, a statement outlining relevant information shall be signed by the interviewer (and interviewee if possible).

- 
- Provide process knowledge information as an attachment to SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([Website](#)). For SNL/CA, see CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, for additional information on the Waste Description and Disposal Request (WDDR) and the waste tag that are also to be completed at SNL/CA for mixed waste. Manage unknown waste for which there is no characterization information as mixed waste, unless process knowledge and/or sampling and analysis can verify that the waste does **not** contain RCRA-regulated hazardous waste, state-regulated hazardous waste, or radioactive waste.

Note: Consult the appropriate Division ES&H Team environmental protection representative for assistance in managing unknown waste. At SNL/CA, also see CPR400.1.1.37/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, and consult the appropriate Division ES&H Team environmental protection representative for information on additional hazardous wastes that are regulated by the state of California.

Note: Contact the [waste characterization project leader](#) for assistance in characterizing unknown waste.

- 
- Assist the [radioactive and mixed waste treatment contact](#) in developing a treatment option for the mixed waste; if the mixed waste to be generated is not within one of the existing SNL/NM treatability groups (see [Attachment 19C-2](#), "SNL/NM Mixed Waste Treatability Groups [TGs]").

Note: For SNL/CA, treatment options are not available.

- Assist the [radioactive and mixed waste operations](#) contact in determining a packaging option for the mixed waste, if the mixed waste generated is remote-handled waste that has a dose equivalent rate greater than 200 mrem/hr at the surface of the unshielded waste container.

Guidance

[Primary waste generators](#) should consider the following in obtaining sufficient process knowledge to identify Resource Conservation and Recovery Act (RCRA)-regulated or state-regulated [hazardous waste](#) in the [mixed waste](#), and to estimate the activity of each radionuclide contaminant in each [waste parcel](#).

- Process knowledge is a characterization technique that relies on the generator's knowledge of the physical, chemical, and radiological properties of the materials associated with waste-generation processes, and/or mixed waste items. It includes knowledge of the fate of those materials during and after the process, and the associated [administrative controls](#).

Process knowledge sources include but are not limited to the following programmatic and waste-stream-specific components:

- Historic records, including historic analytical data.
- Facility maps delineating waste-generation areas.
- Descriptions of waste-generating operations.
- System descriptions.
- Plans and drawings.
 - Areas and/or buildings where each [waste stream](#) is generated.
- Material inputs, including material safety data sheets (MSDSs).
- Manufacturing specifications.

- Mass balance documentation.
 - Literature searches.
 - Living memory (documented interviews).
 - Laboratory notebooks and project reports.
 - Process logs and batch records.
 - Procedures.
-



WASTES WITH NO DISPOSAL PATH

Requirements

Note: Additional information and assistance regarding wastes with no disposal path (NDP) can be provided by the [NDP waste contact](#) . See [Attachment 19C-1](#), “Approval Request Process for Mixed Waste with No Disposal Path.”

[Primary waste generators](#) shall:

- Identify NDP waste by describing the type and quantities of waste likely to be generated from a new project or process.
 - Complete an approval request package, in consultation with the [NDP waste contact](#), if NDP waste is identified.
 - Request approval from DOE in advance to generate any NDP waste, with assistance from the NDP waste contact and in accordance with [Attachment 19C-1](#), “Approval Request Process for Mixed Waste with no Disposal Path.”
 - Review and resubmit the request package for approval each year the waste is generated, unless a disposal path becomes available.
-



MIXED WASTE ACCUMULATION AREAS

Requirements

[Primary waste generators](#) shall determine appropriate locations for [mixed waste](#) accumulation at a satellite accumulation point ([SAP](#)) or at a [less-than-90-day accumulation area](#).

Primary waste generators shall ensure that areas used for mixed waste accumulation:

- Meet the requirements, for SNL/NM, of [Section 19A](#), "Hazardous Waste Management," and [Attachment 19A-1](#), "Managing Hazardous Waste at a Less-Than-90-Day Accumulation Area." Meet the requirements, for SNL/CA, of CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.
- Meet the requirements for radiological work permits specified in CPR400.1.1.32../mn471016, *Radiological Protection Procedures Manual*, [Chapter 1](#), "Radiological Work Planning and Controls."
- Are identified by appropriate radiation-protection signs that are clearly and conspicuously posted. See CPR400.1.1.32../mn471016, *Radiological Protection Procedures Manual*, [Chapter 2](#), "Posting and Labeling for Radiological Control." Consult the appropriate [Division ES&H Team](#) radiation protection representative for assistance.
- Meet applicable [RMMA](#) requirements, as described in [Section 19D](#), "Radioactive Material Management Areas (RMMAs)." Consult the RMMA contact for assistance.
- Are near the point of generation and under the control of the primary waste generator, for waste accumulation at a SAP.
- Are separated from areas with non-waste material.
- Are separated from accumulation areas of [hazardous](#)-only waste or [radioactive-only waste](#).
- Have adequate aisle space around waste containers to preserve emergency

access (see [Chapter 5](#), "Fire Protection").

- Provide [secondary containment](#) systems for mixed waste containers that hold any free liquid and that are located outside, inside near a floor drain, or inside where spilled liquid could be discharged to a sanitary sewer or to the environment. Secondary containment systems shall have:
 - Sufficient capacity to contain 10% of the total volume of the containers, or the volume of the largest container, whichever is greater.
 - A base sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected waste is removed.
 - A sloped base, elevated shelves, or other design features that prevent the containers from coming into contact with spilled or accumulated liquids.



Primary waste generators shall, in the event of a spill or release of mixed waste:

- Implement the applicable evacuation/emergency plan immediately. See [Chapter 15](#), "Emergency Preparedness and Management," for specific requirements.
- Comply with [Section 10E](#), "Chemical Spills," and CPR400.1.1.32../mn471016, *Radiological Protection Procedures Manual*, [Chapter 11](#), "Radiological Incidents."
- Consult the appropriate Division ES&H Team environmental protection representative for assistance in complying with [Section 19D](#), "Radioactive Material Management Areas (RMMAs)," and [Section 18E](#), "Environmental Release Reporting."

Note: A spill or release of mixed waste may require the spill area to be designated an RMMA.

Guidance

[Primary waste generators](#) should:

- Consult the appropriate [Division ES&H Team](#) environmental protection representative for assistance in establishing an appropriate [mixed waste SAP](#) or



[less-than-90-day accumulation area.](#)

- Conduct periodic inspections of mixed-waste-generating processes and SAPs using an inspection form or notes, and retain inspection forms or notes in a project file. Consult the appropriate Division ES&H Team environmental protection representative for assistance in completing the inspection. The inspections should, at a minimum, check that the waste containers are labeled appropriately, the waste containers are in good condition, are closed, and that there are no leaks or spills.
- Ensure that secondary containment systems are designed with additional capacity to contain the volume of fire protection sprinkler water that would be discharged during 20 minutes of flow. Consult the [fire protection contact](#) for assistance in determining the sufficient capacity of secondary containment.



WASTE CONTAINERS AND LABELS

Requirements

Members of the Workforce shall **not** dispose of labels used to indicate [radioactive](#) or [hazardous waste](#) (see [Attachment 19C-3](#), "Samples of Mixed Waste Labels and Tags" in normal office trash unless the words "Caution," "Radiation," "Hazardous Waste," "Radioactive Material," "Tritium Waste," and the trefoil have been removed or obliterated.

If [transuranic mixed waste](#) will be generated, the [primary waste generator](#) shall consult the [transuranic waste management contact](#) for additional requirements regarding containers and labels.

Primary waste generators shall implement the following steps when acquiring containers and labels for [mixed waste](#):

Mixed Waste	
Step	Action

1 Obtain the following, as appropriate:

- A waste accumulation container, such as a plastic bag. If plastic bags are used they shall be clear or light yellow to allow visual inspection of contents through a double-bag.

Note: Attachment [19C-4](#), “Illustration of Waste Parcel,” shows that when [mixed waste](#) is placed into a labeled waste container, it is defined as a [waste parcel](#) .

- An SNL/NM-certified shipping container and liner. These containers include:
 - 30-gallon drums.
 - 55-gallon drums.
 - 85-gallon drums.
 - 7x4x4-ft. boxes.
 - 7x4x2-ft. boxes.
 - Transportainers.

Note: Consult the [radioactive and mixed waste operations contact](#) to determine the appropriate waste accumulation container or SNL/NM-certified waste shipping container.

- **Absorbent.**
- Obtain SNL/NM-certified shipping containers, liners, and absorbent through the [radioactive and mixed waste operations contact](#).
- Certification of existing shipping containers, as necessary.
- Container-handling equipment.

2 Obtain the following labels and forms:

- "Hazardous Waste" label
 - At SNL/NM the Hazardous Waste labels may be ordered through Just-In-Time (JIT) (see Attachment 19C-3, "Samples of Mixed Waste Labels and Tags").
 - At SNL/CA the Hazardous Waste label is generated from the [WDDR Database](#) in accordance with CPR400.1.1/[GN470075](#), "Guidelines for Hazardous Waste Generators at SNL/CA."
- "Caution Radioactive Material" warning label (see Attachment [19C-3](#), "Samples of Mixed Waste Labels and Tags") or "Danger, Radioactive Material" warning label (see CPR400.1.1.32../mn471016, *Radiological Protection Procedures Manual*, Chapter 2, "Posting and Labeling for Radiological Control").
- "Caution Radioactive Material" information tag or "Caution Radioactive Material" information label (see Attachment 19C-3, "Samples of Mixed Waste Labels and Tags").
- "Caution Tritium Waste" warning label (see Attachment 19C-3, "Samples of Mixed Waste Labels and Tags").
- SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form, which includes a Generator Waste Accumulation Disposal Log.



3

Perform the following before use:

- Confirm that shipping containers are SNL/NM-certified by:
 - Verifying that the containers have a bar-coded SNL/NM container number (such as SNL/NM004444).
 - Responding on SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([Website](#)).
- Verify that a SNL/NM-approved liner is in drums and boxes.
- Conduct a pre-use inspection of containers and liners. The inspection includes:
 - Verifying that containers and liners are in good condition and leak-free (i.e., have no tears, dents, creases, bulges, or corrosion that would compromise the integrity of the container). Minor dents or minor surface corrosion are acceptable.
 - Visually evaluating container integrity and verifying that there is no liquid in the container before it is used.
 - Documenting this pre-use inspection by responding on SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form.

Note: This pre-use inspection should also be documented in a log book or noted at the time of the inspection.

Note: If a nonconforming item has been received from the Regulated Waste/Nuclear Material Disposition Department ([RWNMDD](#)), or from an RWNMDD-approved vendor, consult the [radioactive and mixed waste operations](#) contact.

- Consult the [waste certification official](#) if water is found in a

container, or if the integrity of a container has been compromised.

Guidance

[Primary waste generators](#) should obtain labels and tags from Just-in-Time ([JIT](#)), the appropriate [Division ES&H Team](#), the [radioactive and mixed waste operations](#) contact, or the [waste certification official](#).

PACKAGING WASTE IN CONTAINERS

Requirements

If mixed [transuranic waste](#) will be generated, the [primary waste generator](#) shall consult the [transuranic waste management contact](#) for additional requirements regarding packaging and venting of containers.

Primary waste generators shall implement the following steps when packaging solid [mixed waste](#) in containers:

Solid Mixed Waste	
Step	Action
1	<p>Perform the following labeling immediately after waste is placed into the waste parcel:</p> <p>Note: Attachment 19C-4, "Illustration of Waste Parcel," shows that when mixed waste is placed into a labeled waste container, it is defined as a waste parcel.</p> <ul style="list-style-type: none"> Affix and complete, for SNL/NM, a "Hazardous Waste" label, as described under the topic, "Labels," in Section 19A, "Hazardous Waste Management" (see Attachment 19C-3 "Samples of Mixed Waste Labels and Tags").

- Affix and complete, for SNL/CA, the Hazardous Waste label from the [WDDR Database](#) , as described in CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.
- Affix a "Caution Radioactive Material" warning label (see Attachment [19C-3](#), "Samples of Mixed Waste Labels and Tags") or "Danger, Radioactive Material" warning label (see CPR400.1.1.32../mn471016, *Radiological Protection Procedures Manual*, Chapter 2, "Posting and Labeling for Radiological Control"). Consult the appropriate [Division ES&H Team](#) radiation protection representative for assistance on which label to use.

Note: Consult the Division ES&H Team environmental protection representative for assistance with completing the hazardous waste label.

- Consult the appropriate Division ES&H Team radiation protection representative to determine whether a radiological survey is required during accumulation. Also determine whether a "Caution Radioactive Material" information tag or a "Caution Radioactive Material" information label is required during accumulation (see [Attachment 19C-3](#), "Samples of Radioactive Waste Labels and Tags").
- Fill in the appropriate information on the information tag or label, if it is required to be attached to the waste parcel.
- Affix a "Caution Tritium Waste" warning label (see Attachment 19C-3, "Samples of Mixed Waste Labels and Tags") if more than one millicurie of tritium is determined to be present in the waste.
- Record a tracking number directly on the waste parcel, if it does not already have an SNL/NM number.
- Record the start date (the date that mixed waste is first placed in the waste parcel) directly on the waste parcel.

Note: Do not record this start date on the SNL/NM hazardous waste label. The accumulation start date on the hazardous waste

label serves a different purpose (see "[Labels](#)" in Section 19A, "Hazardous Waste Management"). This note is not applicable to SNL/CA.

2

When segregating and placing [mixed waste](#) into a [waste parcel](#), do the following:

- Segregate mixed waste into separate waste parcels according to treatability group (see Attachment [19C-2](#), "SNL/NM Mixed Waste Treatability Groups [TGs]" for information on treatability groups.)
- Add absorbent to waste parcels, if there is potential for condensation or moisture. Examples of such waste parcels include waste excavated from the ground, or potentially damp personal protective equipment such as Tyvek coveralls. Consult the [radioactive and mixed waste operations](#) contact to obtain absorbent, and for assistance on how much absorbent to use.
- Collect waste in a waste container that is appropriate for the waste's physical form and treatability group.
- Place waste in the waste parcel, ensuring that there are no spills, drips, pools, overfills, or radioactive or chemical contamination on the outside of the container.
- Keep the waste parcel closed, except when waste is being added or removed.
- Use a waste container that is made of or lined with a material that will not react with the waste and is otherwise chemically compatible with it.
- Manage waste parcels so that the parcels will not be opened, handled, or stored in a manner that may cause rupture or leakage.

Note: If a mixed waste container leaks, immediately transfer the waste to a container in good condition, or overpack the leaking container. Consult the radioactive and mixed waste operations

contact for assistance on handling a leaking container.

- Load waste containers efficiently to minimize void space.
- Ensure that the gross weight of the waste container, combined with the waste, does not exceed the maximum allowable gross weight stamped on the waste container or according to Department of Transportation regulations. Consult the radioactive and mixed waste operations contact for assistance with this determination.
- Wrap and seal the waste item in plastic, if it is too large to containerize. Consult the [radioactive and mixed waste operations](#) contact for assistance.



3 Double-contain parcels of solid [mixed waste](#) to prepare them for pickup by the Regulated Waste/Nuclear Material Disposition Department ([RWNMDD](#)). Double containment can be done in a number of ways, such as the following:

- Place compactable waste, such as Tyvek coveralls or latex gloves, in a transparent, labeled plastic bag. Once the bag is full, it can be double-bagged by the [primary waste generator](#).
- Place mixed waste metal debris in a lined, labeled, SNL/NM-certified metal drum or metal box.
- Ensure that [sharps](#) are well taped and placed in a lined, metal waste container.
- Ensure that the outer container is labeled appropriately, as described in [Step 1](#).





4

Once the [waste parcel](#) is full and double-contained, do the following:

- Request a radiological survey by the appropriate [Division ES&H Team](#) radiation protection representative to facilitate release of the waste parcel. (See CPR400.1.1.32../mn471016, Radiological Protection Procedures Manual, [Chapter 8](#), "Monitoring Areas and Material.")
- Consult the appropriate Division ES&H Team radiation protection representative to complete and sign the "Caution Radioactive Material" information tag or the "Caution Radioactive Material" information label (see Attachment [19C-3](#), "Samples of Mixed Waste Labels and Tags").
- Do not move the [mixed waste](#) parcel from the satellite accumulation point ([SAP](#)) unless the waste is being transferred to a [less-than-90-day accumulation area](#), or is picked up by the RWNMDD.



[Primary waste generators](#) shall implement the following steps when packaging liquid [mixed waste](#) in containers:

Liquid Mixed Waste

Step	Action
1	<p>Collect liquid mixed waste in an appropriate rigid container (plastic, glass, or metal) that has a screw-cap lid, such as a carboy, or collect it in an approved drum. Before the container is used:</p> <ul style="list-style-type: none"> • Consult the radioactive and mixed waste operations contact for assistance regarding the appropriate container for the liquid waste or waste water. • Ensure that the container is compatible with the liquid waste. • Visually evaluate container integrity and respond on SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form (Website).



2 Perform the following immediately after liquid [mixed waste](#) is first placed in the waste parcel:

- Affix and complete, for SNL/NM, a "Hazardous Waste" label, as described under the topic, "[Labels](#)," in Section 19A, "Hazardous Waste Management." If the contents of the waste are unknown, and therefore the waste shall be managed as [mixed waste](#), record the words "mixed waste" on the "Hazardous Waste" label.
- Complete the Hazardous Waste label, for SNL/CA, that is generated by the WDDR Database, as described in CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.
- Affix a "Caution Radioactive Material" warning label, (see Attachment [19C-3](#), "Samples of Mixed Waste Labels and Tags") or "Danger, Radioactive Material" warning label (see CPR400.1.1.32./mn471016, *Radiological Protection Procedures Manual*, Chapter 2, "Posting and Labeling for Radiological Control"). Consult the appropriate [Division ES&H Team](#) radiation protection representative for assistance on which warning label to use.
- Consult the appropriate Division ES&H Team radiation protection representative to determine whether a radiological survey is required during accumulation. Also determine whether a "Caution Radioactive Material" information tag or a "Caution Radioactive Material" information label is required during accumulation.
- Fill in the appropriate information on the information tag or label, if it is required to be attached to the waste parcel.
- Affix a "Caution Tritium Waste" warning label (see Attachment 19C-3, "Samples of Radioactive Waste Labels and Tags") to the waste parcel if more than one millicurie of tritium is determined to be present in the waste.

- Record the start date (the date that radioactive waste is first placed in the waste parcel) on the waste parcel.
- Record a tracking number on the [waste parcel](#).



3 When placing liquid [mixed waste](#) into a waste parcel, do the following:

- Control the liquid waste parcel in a mixed waste accumulation area with secondary containment, as described under the topic, "[Mixed Waste Accumulation Areas](#)."
- Keep the waste parcel closed at all times, except when waste is being added or removed.
- Always allow adequate headspace in a container of liquid waste such that pressure buildup will not cause leakage from the container.
- Ensure that the gross weight of the waste parcel does not exceed the maximum allowable gross weight, as stamped on the container or according to Department of Transportation regulations. Consult the [radioactive and mixed waste operations](#) contact for assistance with this determination.
- Fill the container no more than 50% full, if stabilization will be a required treatment.

4 To prepare the liquid waste parcel for pickup, place it into a secondary bag, unless the container is a carboy, a sealable can, or a drum.

Note: If the liquid waste parcel is glass, pack it into a bucket with vermiculite or other appropriate absorbent material that will hold the liquid container upright.

5 Label and tag the outer bag or bucket appropriately, as described in [Step 2](#).

 <p>6</p>	<p>Consult the appropriate Division ES&H Team radiation protection representative to:</p> <ul style="list-style-type: none">• Request a radiological survey to facilitate release of the waste parcel (See CPR400.1.1.32../mn471016, Radiological Protection Procedures Manual, Chapter 8, "Monitoring Areas and Material.")• Complete and sign "Caution Radioactive Material" information tag or the "Caution Radioactive Material" information label (see Attachment 19C-3, "Samples of Radioactive Waste Labels and Tags").
 <p>7</p>	<p>Do not move the mixed waste parcel from the SAP unless the waste is being transferred to a less-than-90-day accumulation area, or is picked up by the Regulated Waste/Nuclear Material Disposition Department (RWNMDD).</p>

Guidance

[Primary waste generators](#) should:

- Use indoor accumulation area.
- Place labels in the upper left corner of boxes, or on the upper one-third of drums.
- Use permanent or indelible ink to complete container labels.
- Check labels periodically to ensure their continued legibility.



SEGREGATION AND CONTROL OF MIXED WASTE

Requirements

Note: Proper segregation and control of [mixed waste](#) is required to meet applicable RCRA requirements, state requirements, and treatment or disposal site [waste acceptance criteria](#).

[Primary waste generators](#) shall:

- Segregate mixed waste, by treatability group, into separate [waste parcels](#) (see Attachment [19C-2](#), “SNL/NM Mixed Waste Treatability Groups [TGs]”).

Note: Consult the [permission to generate mixed waste contact](#) for additional information on treatability groups.

- Meet the waste compatibility and segregation requirements, for SNL/NM, under the topic, "[Waste Compatibility and Segregation](#),” in Section 19A, "Hazardous Waste Management,” or for SNL/CA, in CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.
- Segregate classified material from unclassified waste.
- Segregate accountable material.
- Document [waste](#) items placed into a waste parcel, as applicable, using the Generator Waste Accumulation Disposal Log form (found in SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form), or an equivalent form.

Note: The Generator Waste Accumulation Disposal Log is for *heterogeneous* waste, such as metal debris. An example of mixed waste for which a Generator Waste Accumulation Disposal Log Form is especially useful is electronic components.

The Generator Waste Accumulation Disposal Log form is not required if the waste in the waste parcel is a *homogeneous* waste, such as soil from one site, liquid from one process, or compactable personal protective equipment from one process.

- Be aware of criticality issues related to the accumulation of waste if the process involves fissile material (see CPR400.1.1.11/[GN470072](#), *Nuclear Criticality Safety*, for more information).

- See [Section 19A](#), "Hazardous Waste Management," or for SNL/CA see CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, for requirements related to management of explosive waste. If the explosive waste is radioactively contaminated, SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([Website](#)), shall be used instead of an Explosive Waste Disposal Request Form.
- Take precautions to prevent accidental ignition or reaction of ignitable or reactive mixed waste by keeping this waste away from sources of ignition or reaction, such as cutting and welding; hot surfaces; frictional heat; sparks; radiant heat, such as direct sunlight; smoking; or open flames.
- Collect ignitable mixed waste only in a cabinet that complies with applicable guidelines, or in a safety can with an unaltered flame-suppressor mechanism. Avoid combining ignitable and combustible mixed waste in the same waste container (see [Chapter 5](#), "Fire Protection," for additional information on accumulation of flammable material or ignitable waste).
- Implement [administrative controls](#) on the waste parcel to ensure that only allowable items are placed in the waste parcel in accordance with the ES&H [technical work document](#).
- Maintain administrative controls and [traceability](#) of waste parcels until they are picked up by the Regulated Waste/Nuclear Material Disposition Department ([RWNMDD](#)).

Primary waste generators shall segregate mixed waste into separate waste parcels if any of the following are also determined to be present in mixed waste:

- Asbestos, which is regulated by the Toxic Substances Control Act (TSCA).
- Polychlorinated biphenyls ([PCBs](#)), which are regulated by TSCA.
- Compressed gases (unpunctured aerosol cans included).
- [Chelating agents](#) (greater than 1% by weight).
- Pyrophorics.

- Explosives.
- Etiologic agents (such as pathogens or infectious waste).
- Particulates less than 200 micrometers in diameter, which shall be packaged appropriately or immobilized.
- Beryllium greater than 0.1% by weight, which may be released as an airborne particulate and shall be packaged in sealed impermeable bags, containers, or enclosures to prevent the release of beryllium dust during handling and transportation.
- Commercial greater-than-class-C [radioactive waste](#).
- Mixed [transuranic waste](#), for which sealed containers greater than 4 liters are prohibited.
- Animal carcasses.

Note: Consult the [waste certification official](#) for assistance on how to manage, package, and label the above-listed wastes. There may be special packaging and/or labeling requirements for these wastes.

Note: Also see [Section 19A](#), “Planning and Preparation – Waste Identification,” for additional information on segregation and characterization of potential RCRA-regulated waste. **Guidance**

Guidance

[Primary waste generators](#) should segregate containers of incompatible [mixed waste](#) by placing them in separate chemical storage cabinets or on separate secondary containment.

WASTE CHARACTERIZATION - SAMPLING AND ANALYSIS

Requirements


Note: Consult the appropriate [Division ES&H Team](#) environmental protection representative or the [waste characterization project leader](#) for assistance in characterizing the mixed waste. At SNL/CA, also see CPR400.1.1.37/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, and consult the appropriate Division ES&H Team Environmental Protection Representative for information on additional [hazardous wastes](#) that are regulated by the state of California. [Primary waste generators](#) shall:

- Ensure that [mixed waste](#) characterization information includes:
 - Identification of the Resource Conservation and Recovery Act (RCRA)-regulated or state regulated hazardous waste present in the mixed waste. At SNL.NM see [Section 19A](#), "Hazardous Waste Management," for requirements related to the identification of hazardous waste. At SNL/CA, also see CPR400.1.1.37/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.
 - Determination of the underlying hazardous constituents (as defined in 40 CFR 268, *Land Disposal Restrictions*, Subpart A, "General" [[40 CFR 268.2 \(i\)](#)]), if the waste displays a RCRA hazardous characteristic.
 - Estimation of the activity of each radionuclide contaminant in each [waste parcel](#), based on process knowledge and/or sampling and analysis.
 - Identification of contaminants that are controlled by other regulations such as the Toxic Substances Control Act (see "[Segregation and Control of Mixed Waste](#)").

Note: The [Radiological and Mixed Waste Characterization website](#) provides further information to generators of mixed waste.

- Use sampling and analysis to complete characterization of the mixed waste parcel when process knowledge and waste control measures are not adequate for complete characterization.


Note: The primary waste generator pays the costs of sampling and analysis as




part of the characterization requirement to meet the Regulated Waste/Nuclear Material Disposition Department ([RWNMDD](#)) [waste acceptance criteria](#).

- Consult with the [waste characterization project leader](#) for assistance with the following:
 - Developing a sampling and analysis approach such that data is representative of the waste, and determining whether a sampling and analysis plan is needed.
 - Sampling the waste.

Note: Samples of waste shall be collected by trained Members of the Workforce according to specific sampling procedures.

- 
- Interfacing with the appropriate Division ES&H Team for radiation protection coverage during the sampling event and for acquiring radiological survey data that could aid in characterization of the waste.
 - Interfacing with the [Sample Management Office](#).
 - Completing any necessary forms.

When a sampling and analysis plan is required for a project, the primary waste generator shall:

- 
- Write the plan in accordance with SNL/NM, [PLA 96-02](#), *Sampling and Analysis Plan for Characterization of Low-level Radioactive and Mixed Waste*.
 - Ensure that the plan is reviewed by appropriate subject matter experts and by the waste characterization team leader, and that the plan is approved.
 - Develop a schedule for updating the plan and supporting procedures at least every three years, if they are still in use.

Primary waste generators shall:

- Ensure that sampling and analysis data have gone through appropriate data verification and validation.

Note: Consult the waste characterization team leader for assistance with data verification and validation. The waste characterization team leader will determine whether data verification and validation are required for a specific data set. If such actions are deemed necessary, the Sample Management Office will perform data verification and validation.

- Document why sampling and analysis could not be performed, if it is unsafe or impractical to obtain representative samples because of high radioactivity or because of the heterogeneity of the waste material.

Guidance

[Primary waste generators](#) should consult the appropriate [Division ES&H Team](#) environmental protection representative or the [waste characterization project leader](#) for assistance in reviewing characterization data to determine the appropriate waste categorization (for example, [mixed waste](#), [radioactive waste](#), [hazardous waste](#), or non-regulated waste).

Note: SNL has limited radiological laboratory and chemical laboratory capabilities. For some analyses, samples must be sent to a commercial laboratory. In addition, certain disposal sites require sampling and analysis to be conducted and samples to be analyzed at a commercial laboratory that is state-certified or DOE-certified.

PROCESSING OF MATERIAL OR TREATMENT OF MIXED WASTE


Note: This treatment section applies only to treatment activities occurring on [Sandia-controlled premises within](#) the state of New Mexico. **Waste treatment at SNL/CA is not allowed** unless special permits are obtained before treatment.

Requirements

[Primary waste generators](#) shall **not** do any of the following with material or [mixed waste](#), unless the appropriate [Division ES&H Team](#) environmental protection representative obtains written approval:

- Process material, such as neutralizing a liquid solution as part of a process.
- Recycle, dilute, or volume-reduce mixed waste.
- Stabilize mixed waste.

Note: The written approval would also identify notifications/certifications to be provided by the primary waste generator who conducts treatment required by [40 CFR 268](#), *Land Disposal Restrictions*.




Note: For some processes, treatment of material or waste at the generator location may be the most efficient and cost-effective treatment approach. In most cases, it is preferred that treatment be implemented by the [radioactive and mixed waste treatment contact](#) after the waste is picked up by the [Regulated Waste/ Nuclear Material Disposition Department \(RWNMDD\)](#).

Primary waste generators shall:


- Use an appropriate method and procedure to treat material or waste so that the disposal site can meet its performance objectives.

Note: Ensure that any specifications required to implement treatment are incorporated into the planning for management of the waste if material or waste is to be treated in some manner. For example, if liquid mixed waste is to be treated using stabilization, fill the waste container at most 50% full. The empty space will allow the stabilization material to be added to the container.

- 
- Ensure that the stabilization agent is obtained from the [radioactive and mixed waste operations](#) contact and used in the correct amount, if approval is given to conduct treatment at the generator location.

PROHIBITIONS REGARDING DISPOSAL OF MIXED WASTE

Requirements



[Primary waste generators](#) shall **not** do any of the following with [mixed waste](#):

- Allow the waste to enter sanitary waste lines or storm sewers via sinks, toilets, etc.
 - Allow the waste to evaporate or disperse into the atmosphere.
 - Bury the waste or release it to the ground, either directly or indirectly.
 - Discard the waste into trash cans or dumpsters.
 - Remove the waste from [Sandia-controlled premises](#).
 - Manage mixed waste in any manner that could be construed as disposal.
-




DISPOSAL REQUEST FOR MIXED WASTE

Requirements

[Primary waste generators](#) shall **not**:

- Include any information on process knowledge forms or disposal request forms that are submitted with regard to classified material that would cause the form itself to be a classified document.

Note: Consult the appropriate [Division ES&H Team](#) environmental protection representative or the [waste characterization project leader](#) for information and assistance in appropriately managing and characterizing classified material.

- 
- Add waste to a [waste parcel](#) for which SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([website](#)), has been submitted.

Primary waste generators shall:

- Complete SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([website](#)) to request pickup of [mixed waste](#) by the Regulated Waste/Nuclear

Material Disposition Department ([RWNMDD](#)) . In addition, SNL/CA primary waste generators shall coordinate the submittal and pick-up of Waste Description and Disposal Request (WDDR)-required documentation in accordance with CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.

Note: Consult the appropriate Division ES&H Team environmental protection representative for assistance in completing the Disposal Request Form.



- Record each waste parcel on the Disposal Request Form.

Note: Multiple mixed waste parcels can be submitted on one Disposal Request Form, but the waste in each parcel shall be of the same treatability group indicated on the Disposal Request Form, unless an exception is granted by the [waste characterization project leader](#).

- Record the start date (the date that waste is first placed in a waste parcel) on the Disposal Request Form.
- Sign the Generator Waste Accumulation Disposal Log, when accumulation has been completed (see the table below for the log’s location).
- Sign the Disposal Request Form.




Note: The “NTS Waste Stream Information” section of the Disposal Request Form is not to be completed by the primary waste generator for [mixed waste](#).

- Attach the following documentation to the Disposal Request Form:

Document	Location and Format
Process knowledge documentation	Memo or other suitable form.



<p>Sampling and analysis results, as needed</p> <p>Note: Provided for mixed waste that cannot be characterized through use of process knowledge and waste control.</p>	<p>SNL/NM PLA 96-02, <i>Sampling and Analysis Plan for Characterization of Low-Level Radioactive and Mixed Waste</i>.</p>
<p>The Generator Waste Accumulation Disposal Log, if appropriate.</p> <p>Note: The log is to be included for each waste parcel that contains different items within a heterogeneous waste stream.</p>	<p>SF 2042-TRA, SNL/NM Radioactive or Mixed Waste Disposal Request Form or an equivalent form.</p>
<p>Radiological survey documentation</p> <p>Note: Review the radiological survey form to ensure that:</p> <ul style="list-style-type: none"> ● The form records survey/swipe results and dose rates on the waste parcel. ● The Division ES&H Team radiation protection representative has completed and signed the form. 	<p>Radiological survey form.</p>




Data verification and data validation documentation, as requested by the [waste characterization project leader](#).

Note: These forms are completed by the reviewer.

Data verification review form or data validation review form.

- Submit the Disposal Request Form to the [radioactive and mixed waste operations](#) contact in a timely manner such that the waste can be picked up from a [satellite accumulation point \(SAP\)](#) before the volume of [mixed waste](#) reaches 55 gallons (or 1 quart of [acute hazardous waste](#) or extremely hazardous waste), or from a [less-than-90-day accumulation area](#) before the 90-day limit expires for the waste parcel.

Note: In general, a minimum of a month is needed from disposal request submittal to waste pick-up; when there are no questions or no additional information is needed to complete the review or the Disposal Request Form.

- 
- Submit the Disposal Request Form to the radioactive and mixed waste operations contact in a timely manner such that the waste is picked up from the SAP within one year of the start date.

Note: This requirement is not applicable to the Environmental Restoration Program.

Note: Once the DR is approved by the RWNMDD, the RWNMDD pick-up crew will call to schedule pick-up of the mixed waste.

- Request an allowance to accumulate mixed waste for longer than one year, if needed, from the manager of the RWNMDD or from the SNL/CA [radioactive and mixed waste operations contact](#).



Guidance

If the [waste parcel](#) does **not** meet the Regulated Waste/Nuclear Material Disposition Department ([RWNMDD](#)), [waste acceptance criteria](#) for storage in an onsite storage

facility (see SNL/NM, [POL 95-01](#), Programmatic Waste Acceptance Criteria [WAC]), the waste parcel cannot be picked up by the RWNMDD and the [primary waste generator](#) should:

- Consult with the [radioactive and mixed waste operations](#) contact for assistance in developing a justification for a variance of the RWNMDD waste acceptance criteria and in developing a packaging method to meet waste acceptance criteria.

Primary waste generators should:

- Make a copy of the Disposal Request Form for the project file.
- For SNL/CA, make a copy of the WDDR for the project file.

CERTIFICATION OF MIXED WASTE

Requirements

[Primary waste generators](#) shall provide the [waste certification official](#) with additional information that might be required by:

- The waste certification official during certification or assessment activities.
- The intended treatment, storage, and disposal facility.

Note: The waste certification official periodically observes waste packaging activities that are conducted by the primary waste generator.

Note: The waste certification official periodically assesses waste management activities at generator locations and provides a report to the primary waste generator. If a finding is identified, see “Nonconformances.”

NONCONFORMANCES



Requirements

When a nonconformance of procedure occurs that is related to management of [mixed waste](#), [primary waste generators](#) shall ensure that:

- Their manager is notified.
- An SF 2042-NCA, SNL Nonconformance Corrective Action Report (NCAR) ([Word file](#)), is completed for the nonconformance and submitted to the [quality assurance program project leader](#).
- Corrective actions identified in the Nonconformance Corrective Action Report are implemented and documentation of implementation is provided to the quality assurance program project leader.




Guidance

[Primary waste generators](#) should:

- Implement the [OOPS](#) process as appropriate.
- Conduct and document self-assessments for compliance with [mixed waste](#) management requirements.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to management of [mixed waste](#) include:



Hazard/Activity	Reference
Asbestos	Section 6B , "Asbestos.," Section 19F , "Other Waste."
Beryllium	Section 6Z , "Chronic Beryllium Disease Prevention Program."

Biological agents	Section 6N , "Biological Agents and Biosafety."
Chemical handling	Section 6D , "Hazard Communication Standard." Section 6E , "Laboratory Standard - Chemical Hygiene Plan." CPR400.1.1.24/ GN470094 , <i>Handling Chemicals at SNL/CA.</i>
Chemical spills	Section 10E , "Chemical Spills."
Confined space	Section 6I , "Confined Space Entry."
Explosives	Chapter 9 , "Explosives Safety."
Hazardous waste	Section 19A , "Hazardous Waste Management." CPR400.1.1.37/ GN470075 , <i>Guidelines for Waste Generators at SNL/CA.</i>
Lead bank	Section 10L , "Management of Excess Metallic Lead."
Nuclear criticality	CPR400.1.1.11/ GN470072 , <i>Nuclear Criticality Safety.</i>
Polychlorinated biphenyls (PCBs)	Section 10D , "Polychlorinated Biphenyl (PCB) Management."
Pressurized drums	Section 10A , "Pressurized Drums."
Radioactive waste	Section 19B , "Radioactive Waste Management."
RMMAs	Section 19D , "Radioactive Material Management Areas (RMMAs)."
Radiation protection	Chapter 8 , "Occupational Radiation Protection."

Recycling material	Section 4P , "Housekeeping." CPR 500.2.3, Property/Assets User's Manual, Chapter 5 , "Identifying and Handling Excess Property."
Respiratory protection	Section 6C , "Respiratory Protection."
Toxic Substances Control Act (TSCA)	Section 6S , "Toxic Substances Control Act (TSCA)."



REFERENCES

Requirements Source Documents

[10 CFR 835](#), *Occupational Radiation Protection*.

[40 CFR, Subchapter R](#), *Toxic Substances Control Act*

[42 USC 6901, et seq.](#), *Resource Conservation and Recovery Act of 1976*.

[42 USC 13106 et seq.](#), *Pollution Prevention Act of 1990*.

[DOE O 435.1, Chg 1](#) *Radioactive Waste Management*.

Implementing Documents

CPR400.1.1.11/[GN470072](#), *Nuclear Criticality Safety*.

CPR400.1.1.24/[GN470094](#), *Handling Chemicals at SNL/CA*.

CPR400.1.1.31/[MN471011](#), *Sandia Explosives Safety Manual*.

CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.

CPR400.1.1.37/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA.*

SNL, [AOP 00-03](#), *Data Validation Procedure for Chemical and Radiochemical Data.*

SNL, [AOP 94-18](#), *Nonconforming Processes and Items.*

SNL, [FOP 00-02](#), *Waste Handling.*

SNL, [PG470228](#), *Radioactive Waste Management Basis.*

SNL, [PLA 94-40](#), *Program Plan for Managing Radioactive Material Management Areas (RMMAs).*

SNL, [PLA 96-02](#), *Sampling and Analysis Plan for Characterization of Low-level Radioactive and Mixed Waste.*

SNL, [PLA 96-15](#), *Quality Assurance Plan (QAP).*

SNL, [POL 95-01](#), *Programmatic Waste Acceptance Criteria (WAC).*

SNL, [SMO-05-03](#), *Procedure for Completing the Contract Verification Review.*

SNL, *Comprehensive Part B Permit Request.*

SNL, [Pollution Prevention Plan](#).

SNL/NM, *Site Treatment Plan for Mixed Waste.*

Related Documents

[20.4.1 NMAC](#), *Hazardous Waste Management.*

[20.9.1 NMAC](#), *Solid Waste Management.*

[40 CFR 261.3](#), *Definition of Hazardous Waste.*

[40 CFR 261.7](#), *Residues of Hazardous Waste in Empty Containers.*

[40 CFR 261.24](#), *Toxicity Characteristic.*

[40 CFR 261.33](#), *Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof.*

[40 CFR 262.11](#), *Hazardous Waste Determination.*

[40 CFR 262.34](#), *Accumulation Time.*

[40 CFR 265](#), *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.*

[40 CFR 265](#), *Appendix V, "Examples of Potentially Incompatible Waste."*

[40 CFR 265.171](#), *Condition of Containers.*

[40 CFR 265.172](#), *Compatibility of Waste With Container.*

[40 CFR 265.173](#), *Management of Containers.*

[40 CFR 268](#), *Land Disposal Restrictions.*

[42 USC 2011 et seq.](#), *Atomic Energy Act of 1954 (AEA), as amended.*

[49 CFR 172](#), *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements.*

[49 CFR 173](#), *Shippers—General Requirements for Shipments and Packagings.*

[DOE/NV-325](#), *Nevada Test Site Waste Acceptance Criteria.*

[DOE O 5400.5, Chg 2](#), *Radiation Protection of the Public and the Environment.*



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ES&H Manual

*SECTION 10F - OIL AND FUEL STORAGE

Subject Matter Expert: [Charles Roma](#); CA Counterpart: [Robert Holland](#)

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Review Date: March 10, 2006

* Indicates a substantive change



- [*Applicability](#)
- [Roles and Responsibilities](#)
- [Training](#)
- [*Inspections](#)
- [Secondary Containment](#)
- [Storage Tanks](#)
- [Record Keeping](#)
- [Spills and Reporting](#)
- [References](#)
- Attachment
 - [*10F-1](#) - Special Requirements for Storage Tanks Regulated by the New Mexico Environment Department
- Forms
 - SF 2001-OIC, Oil Storage Facility Inspection Checklist ([Word file](#)/[Acrobat file](#))
 - SA 2001-ROD, Record of Drainage from Secondary Containment Structures ([Word file](#)/[Acrobat file](#))



*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce who:

- Perform activities on Sandia-controlled premises within the state of New Mexico, Tonopah Test Range (TTR), and Kauai Test Facility (KTF). This section does not apply to SNL/CA.
- Work with [aboveground oil-storage tanks](#) or [underground oil-storage tanks](#) and containers with a capacity of 55 gallons or greater.

Additional state of New Mexico requirements apply to aboveground tanks with a capacity greater than 1,320 gallons but less than 55,000 gallons, and underground oil-storage tanks with a capacity of 110 gallons or more. See Attachment [10F-1](#), "Special Requirements for Storage Tanks Regulated by the New Mexico Environment Department."

*Exemptions

The following are exempt from the requirements of this chapter:

- Pole-mounted transformers.
- Department of Transportation (DOT)-regulated vehicles (any vehicles licensed for use on public roads).
- Electrical equipment.

ROLES AND RESPONSIBILITIES

SPCC Coordinator

The Spill Prevention Controls, and Countermeasures ([SPCC](#)) [Coordinator](#) is responsible for program administration and coordination on a site-wide basis. The SPCC Coordinator is a member of the [Environmental Planning](#) who provides consultation for line organizations and interfaces between the line organizations, the Department of Energy (DOE), and regulatory agencies.

Requirements

The SPCC Coordinator shall:

- Maintain a complete copy of the [SPCC Plan](#) (including any amendments) and copies of all annual inspection reports, and make the SPCC Plan available to the Environmental Protection Agency (EPA) Regional Administrator for onsite review during normal working hours.
- Ensure that required reviews and amendments of the SPCC Plan are executed within the specified time limits.
- Review designs and modifications to existing facilities to ensure that they meet the requirements of the SPCC Plan.
- Coordinate provisions of the SNL /NM SPCC Plan with other SNL contingency and emergency plans. KTF and TTR have site-specific SPCC Plans.
- Perform annual inspections of [oil](#) fuel storage facilities to ensure compliance with the SPCC Plan and this section of the ES&H Manual.

Department Managers

Requirements

The Department Manager shall:

- Report all changes in the storage capacity of oil or fuel to the [Environmental Planning](#).

- Ensure that storage tank systems (aboveground and underground) are operated and maintained in accordance with the manufacturer's recommendations and specifications.
- Ensure that leak-detection systems are maintained and tested according to the manufacturer's recommendations.
- Confirm completion of corrective measures.
- Verify that [inspections](#) have been conducted.
- Ensure that all [oil-handling Members of the Workforce](#) receive Oil Spill Plan Awareness training (ENV 190), which covers:
 - Operation and maintenance of equipment to prevent discharges.
 - Discharge procedure protocols.
 - Applicable pollution-control laws, rules, and regulations.
 - General facility operations.
 - The contents of the [SPCC Plan](#).
- Ensure that all oil-handling Members of the Workforce attend a site-specific discharge-prevention briefing (ENV 191) at least once a year to ensure adequate understanding of the SPCC Plan. The briefing highlights and describes known discharges, including failures, malfunctioning components, and any recently developed precautionary measures.
- Maintain a record of drainage of secondary containment structures using SA 2001-ROD, Record of Drainage from Secondary Containment Structures ([Word file/ Acrobat file](#)).
- Maintain records of all inspections, repairs, and inventories.

Oil-Handling Members of the Workforce

Requirements

Oil-handling Members of the Workforce shall:

- Conduct work activities in such a manner as to prevent discharges.
- Check facilities and equipment, including tanks, containers, valves and piping, whenever they are operating or maintaining them, for signs of deterioration, leaks, and/or damage.
- Note and report any accumulation of oil or precipitation in secondary containment structures.
- Complete the required training and briefings.

TRAINING

Requirements


Training courses required for various job categories are as follows:

Role	Required	Recommended
SPCC Coordinator	ENV190	N/A
Line Department Manager	N/A	ENV190 ENV191
Oil-Handling Members of the Workforce	ENV190 ENV191	N/A

Members of the Workforce shall be trained to deal with a [spill](#) before they attempt to clean up any unplanned release of oil.

The department Training Coordinator shall document and maintain records of training in accordance with [Chapter 11](#), "ES&H Training."

Guidance



Managers should augment the course content with information about best practices specific to the workplace.

*INSPECTIONS

*Requirements

Members of the Workforce responsible for [oil-storage facilities](#) or equipment shall:

- Conduct monthly inspections of all bulk oil-storage containers with a capacity of 55 gallons or greater.
- Document the inspections with either the Storage Facility Inspection Checklist, SF 2001-OIC, ([Word file/Acrobat file](#)) or forms developed for their site-specific operation with approval from the SPCC Coordinator.
- Retain a copy of the checklist at the facility for three years.
- Send a copy of the checklist identifying any deficiencies to the [SPCC Coordinator](#).
- Correct any deficiencies noted during the inspection.
- Maintain records or logs of all inspections, tests, or inventories for a minimum of three years.

Note: After three years records shall be handled in accordance with SNL's Records and Document Management System.



Guidance

Members of the Workforce, who operate, maintain, or use equipment with [oil](#) or fuel should check facilities and equipment, including aboveground valves and piping, for signs of deterioration, leaks, or damage whenever they operate or maintain them.

The following can provide assistance in correcting deficiencies:

Subject	Contact
Determining actions to bring a facility into compliance.	SPCC Coordinator
Arranging for facility repairs or improvements.	Facilities building manager



SECONDARY CONTAINMENT

Requirements

Members of the Workforce shall:

- Position or locate mobile or portable oil-storage containers in such a way as to prevent a discharge.
- Furnish a secondary means of containment that is large enough to hold the volume of the largest container, or 10% of the total storage capacity, whichever is greater, with a 3-in. depth remaining to collect precipitation.





- Ensure that secondary containment:
 - Is provided for all oil-storage tanks or containers that have a storage capacity of 55 gallons or more.
 - Does **not** have automatic drains on secondary containment, such as sump pumps that go on automatically, and all drain valves are locked in the closed position.
 - Has valves on tanks or containers that are positioned so that, in the event of a failure, the contents drain into the secondary containment structure.

Members of the Workforce shall drain secondary containment structures as follows:

Situation	Action



<p>Normal operations</p>	<ol style="list-style-type: none"> 1. Inspect for the presence of oil or contaminated storm water (water is contaminated with oil if it displays a visible or iridescent sheen). <p>Retain a record of the drainage, using SA 2001-ROD, Record of Drainage from Secondary Containment Structures (Word file/Acrobat file).</p>
<p>Emergency at SNL/NM</p> 	<ol style="list-style-type: none"> 1. Label the containers as Hazardous Waste and follow the guidance in Chapter 19A of the ES&H Manual until the waste is proven to be non hazardous by laboratory analysis. 2. Contact the Emergency Hotline, 911. 3. Transfer any oil or contaminated water into appropriate containers (55-gallon drums are best).
<p>Emergency at TTR and KTF</p> 	<p>Follow the same steps as for SNL/NM.</p> <p>Contact the appropriate hotline listed in the Spill Reporting section of this chapter.</p>

Note: If a situation requires immediate drainage of a secondary containment structure before the water can be tested for contaminants, transfer any water that might be contaminated to appropriate containers and contact the site [ES&H coordinator](#), who will arrange to have samples drawn for testing.

Guidance

Draining secondary containment structures entails the risk of releasing contaminated water to the environment. Whenever contaminated water is released to the environment, it is considered an occurrence reportable to DOE, which reports it to EPA and the state

of New Mexico, Nevada, or Hawaii, as appropriate. The record of drainage should contain the estimated quantity and a statement that there was no visible contamination.



STORAGE TANKS

Requirements

Members of the Workforce shall ensure that:

- Tank fill and transfer ports are capped when not in use.
- Tank fill and transfer ports are clearly marked.
- The master flow and drain valves, and any other valves permitting direct outward flow of the container's contents to the surface, have adequate security measures so that they remain in the closed position when in non-operating or non-standby status.
- The starter control on each oil/petroleum pump is in an area accessible only to authorized Members of the Workforce and is locked in the "off" position when the pump is in a non-operating or non-standby status.
- All loading/unloading connections of oil pipelines or facility piping are securely capped or blank-flanged when they are not in service or are in standby service for an extended time.
- Buried tanks and piping are protected from corrosion by coatings or cathodic protection compatible with local soil conditions.
- Storage tanks are tested for integrity on a regular schedule, and whenever material repairs are made.
- Loading and unloading areas are equipped with one of the following to prevent vehicles from departing before they are completely disconnected from flexible or fixed oil-transfer lines:
 - Interlocked warning light or physical barrier system.



- Warning signs.
- Wheel chocks.
- Vehicle brake-interlock system.

- Oil-storage tanks are equipped with one of the following:

- High-liquid-level alarms, with an audible or visual signal, at a constantly attended operation or surveillance station.
- High-liquid-level pump-cutoff devices set to stop flow at a predetermined container-content level.
- Direct audible or code signal communication between the oil-storage tank and the pumping station operators.
- A fast-response system, such as a digital computer or a direct vision gauge, for determining the liquid level of each [bulk storage container](#).

Note: The fast-response system requires a Member of the Workforce to be present at all times to monitor gauges and the overall filling of bulk storage containers.

- Liquid-level-sensing devices on oil-storage tanks are tested on a regular schedule to ensure proper operation.
- Adequate lighting, fencing, and locks are used to control access to storage facilities to deter sabotage and protect inventories.
- All changes in the storage capacity of oil or fuel are reported to the SPCC Coordinator.

Members of the Workforce shall consult the SPCC Coordinator:

- For specific guidance regarding testing storage tanks for integrity.
- For guidance regarding storage tank closure.

- At least sixty days prior to the installation, closure, or routine repair of any storage



tank.

Special Testing Requirements for Aboveground Tanks

Members of the Workforce shall:

- Test each aboveground tank for integrity on a regular schedule, and whenever material repairs are made.
- Take into account tank size and design when deciding the frequency and type of testing to be performed. Contact the [SPCC Coordinator](#) for additional guidance.
- Combine visual inspection with another testing technique such as:
 - Hydrostatic testing.
 - Radiographic testing.
 - Ultrasonic testing.
 - Acoustic-emissions testing.
 - Another system of non-destructive shell testing.

Note: Contact the SPCC Coordinator for guidance on tank testing.

- Keep records of inspections and tests, and comparison records, under usual and customary business practices.
- Inspect the tank's supports and foundations.
- Inspect the outside of the container frequently for signs of deterioration, discharges, or accumulation of oil inside diked areas.

Special Testing Requirements for Underground Tanks

Members of the Workforce shall test underground storage tanks according to the following schedule:

System	Test/Inspection	Frequency
Tank	Tightness test	Every 5 years
Suction piping	Tightness test	Every 3 years
Pressurized piping system	Tightness test	Annually

RECORDKEEPING

Requirements

Member of the Workforce shall:

- Retain a copy of inspection checklists at the facility for three years.
- Maintain records of tank testing and maintenance to allow comparison of test results.
- Forward copies of any test results or maintenance records to the SPCC Coordinator.
- Maintain, for three years, record of inspections, repairs, tests, maintenance, or the draining of secondary containment structures.

Note: After three years records shall be handled in accordance with SNL's Records and Document Management System.

SPILLS AND REPORTING

Requirements

Members of the Workforce shall:

- Report immediately to their Manager and the applicable hotline (see [Chapter 15](#), "Emergency Preparedness and Management ") any unplanned [release](#) of oil or fuel, regardless of amount or location.

- Take the necessary and appropriate corrective actions as soon as possible after learning of a spill, to contain and remove any spilled material or mitigate the damage caused by the spill, **if** it is safe to do so and they have the appropriate training.

Reporting Hotlines:

Emergency Phone Numbers

Location	Phone
SNL/NM (within KAFB)	911 or 844-0911 (cellular)
TTR	911
KTF	335-5611 or 0 (emergency)

Non-Emergency Phone Numbers

Location	Phone
SNL/NM (within KAFB)	311 or 844-6515 or 844-0311 (cellular)
TTR	295-8285
KTF	335-5611 or 0

Note: All rags, soil, and absorbent materials used during cleanup are considered part of the spill and shall be disposed of in accordance with the requirements of [Section 19A](#), “Hazardous Waste Management.”

Members of the Workforce shall contact the [Environmental Planning](#) or the SPCC Coordinator for help in determining whether an unplanned release:

- Is a [reportable quantity](#) under federal regulations.
- Is reportable to state and local agencies.
- Exceeds any permit limits.

Guidance

Unless there are other reliable methods for estimating the amount of the spill, use the

difference between the last reported inventory amount and the volume remaining in the container after the spill as the estimated spill volume.

REFERENCES

Requirements Source Documents

[20 6.2 NMAC](#), *Ground and Surface Water Protection*.

[20.5 NMAC](#), *Petroleum Storage Tanks*.

[29 CFR 1910.120](#), *Hazardous Waste Operations and Emergency Response*.

[40 CFR 110](#), *Discharge of Oil*.

[40 CFR 112](#), *Oil Pollution Prevention*.

[40 CFR 261](#), *Identification and Listing of Hazardous Waste*.

[40 CFR 280](#), *Technical Standards and Corrective Action Requirements for owners and Operators of Underground Storage Tanks (UST)*.

[DOE O 450.1, Chg. 1](#), *Environmental Protection Program*.

[NAC 445A](#), Nevada Administrative Code, *Water Controls*.

Implementing Documents

SNL/NM [Emergency Plan](#).

SNL/NM [Spill Prevention Controls and Countermeasures Plan](#).

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IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 9 – EXPLOSIVES SAFETY

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* Indicates a substantive change

- [Applicability](#)
 - [*Explosives Operations](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This chapter applies to all Members of the Workforce whose activities involve explosives or energetic materials. This chapter does not apply to the use of only household-type energetic materials, such as matches or gasoline.



*EXPLOSIVES OPERATIONS

*Requirements

Members of the Workforce shall follow the [explosives](#) operations requirements stated in [CPR400.1.1.31/MN471011](#), *Sandia Explosives Safety Manual*, for **ALL ACTIVITIES** involving explosives regardless of the amount of explosives involved.

Guidance

For assistance regarding the requirements for explosives operations, contact your [Division ES&H Team](#).



RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Technical work documents	Chapter 21 , "Technical Work Documents (TWDs)"

REFERENCES

Requirements Source Documents



[DOE M 440.1-1A](#), *DOE Explosives Safety Manual*.

Implementing Documents

[CPR400.1.1.31/MN471011](#), *Sandia Explosives Safety Manual*.

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ES&H Manual

CHAPTER 12 – PACKAGING AND TRANSPORTATION OF HAZARDOUS MATERIAL



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- [Section 12A](#) – Onsite Packaging and Transportation (P&T) of Hazardous Material
 - [Section 12B](#) – Offsite Shipment and Transport of Hazardous Material
 - *[Section 12C](#) – Commercial Motor Vehicles (CMVs) and Commercial Driver's Licenses (CDLs)
-

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ES&H Manual

SECTION 4T – FIREARMS SAFETY

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- 
- [*Applicability](#)
 - [*Training](#)
 - [*General Firearms Safety](#)
 - [Use of Firearm-Like Items](#)
 - [*Reporting](#)
 - [*Safety and Risk Analysis](#)
 - [*Personal Protective Equipment \(PPE\)](#)
 - [Loading and Unloading of Firearms](#)
 - [Exposure to Hazardous Material and Environments](#)
 - [Influence of Drugs and Alcohol](#)
 - [*Storage and Transportation of Firearms and Munitions](#)
 - [Acquisition of Firearms and **Munitions**](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
 - Attachments
 - [*4T-1](#) - Conducting Internal Firearms Safety Appraisals
 - [*4T-2](#) - Checklist for Unauthorized Discharges (UDs)
 - [*4T-3](#) - Firearm Safety Rules
 - [4T-4](#) - Firearm and Firearm-Like Item Color Codes
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to **all SNL organizations**, Members of the Workforce, and [Firearms Authorized Personnel \(FAP\)](#), on [Sandia-controlled premises](#) whose activities involve the following:

- [Non-security use of firearms.](#)

Note: This applies to **the use of firearms on** DOE live-fire shooting ranges, and non-Sandia-controlled premises where FAP are engaged in approved activities.

- [Security use of firearms.](#)

Note: The DOE Protective Force Program has established orders and standards for **the protective force (ProForce) organizations of** contractors (e.g., Sandia National Laboratories) to follow in addition to, or in place of, the requirements outlined within this section. As such, specific requirements outlined in this section apply, when not in conflict with DOE requirements for the security use of firearms. These orders and standards include:

- [DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*
- [DOE M 470.4-3](#), *Protective Force.*

At non-Sandia-controlled premises, the following requirements apply (in order of importance) to Members of the Workforce and [FAP](#):

1. State and local regulations applicable to the site.
2. Specific requirements of the host facility.

3. Specific requirements within this document, when not in conflict with either of the above.


Exemptions



Requests for variances to requirements in this document are to be submitted to the Sandia [Joint Firearms Safety Committee \(SJFSC\)](#) for review and approval prior to beginning the CPR exception process, if appropriate, as described in CPR001.1, *Corporate Business Rules System Standard*, [Section 3.7](#), "Exceptions to Corporate Business Rules." Requests for variances to requirements that stem from DOE orders are forwarded to DOE for approval, if the [SJFSC](#) concurs. See "General Firearms Safety," for specific requirements for various types of requests. Questions regarding the applicability of variances should be forwarded to the [firearms Subject Matter Expert \(SME\)](#).

Note: Although certain activities conducted by contractors, subcontractors, or members of the public are excluded from this section, Sandia may require the contractors or members of the public to comply with specific provisions of this manual (e.g., site specific training, safe handling instruction) in order to protect Sandia employees, operations, contractors and members of the public. If a subcontractor or member of the public is bringing firearms on site, the sponsoring Sandia department or organization **must notify** the appropriate Security and ES&H support organizations **so they may evaluate** potential impacts and **provide** essential guidance.

*TRAINING

Position or Activity	Required	Recommended
Managers and supervisors		National Rifle Association (NRA), Basic Firearm Training Course.

<p>Armorer</p> 	<p>Must acquire and maintain <u>DOE National Training Center (NTC)</u> certified armorer's status and specific manufacturers' qualifications.</p>	
<p><u>Firearms custodians</u></p>		<p>National Rifle Association (NRA), <u>Basic Firearm Training Course</u>.</p>
<p><u>Firearms-authorized personnel (FAP)</u></p>	<p>NRA <u>Basic Firearm Training Course</u> (refresher training required every three years), or equivalent documented certification from a manufacturer or NTC course.</p>	
<p>Emergency response</p> 	<p>See <u>Chapter 16</u>, "Health, Benefits and Employee Services," and CPR400.1.1.19/<u>GN470086</u>, <i>SNL Bloodborne Pathogens Exposure Control Plan</i>, for specific training requirements.</p>	
<p>Members of the Workforce who use <u>firearm-like items</u></p>	<p>Site-specific OJT training</p>	
<p>Members of the Workforce who are or may be exposed to noise levels at or above 85 decibels (dB) averaged over eight working hours or an 8-hour time-weighted average</p>	<p>See <u>Section 6H</u>, "Noise Exposure and Hearing Conservation"</p>	

Shipping/receiving personnel		Site-specific OJT training
<p>Firearms SME</p>  	<p>Basic Firearms Training: <u>National Training Center: Basic Firearms Training (online course PFT-112) or National Rifle Association Basic Firearm Training Course.</u></p> <p><u>National Training Center: Protective Force Safety Fundamentals SAF-250 (40 hr. course)</u></p> <p>SNL Firearms Management System training to include:</p> <ul style="list-style-type: none"> ● Oracle Training ● Firearms Custodian ● Administrator ● FAP Firearms Authorized Personnel 	<p>OJT</p> <ul style="list-style-type: none"> ● Assist in annual Firearms Appraisals (SNL/NM, SNL/CA, TTR, AK) conducted by members of SJFSC. ● Read and become familiar with the following: <ul style="list-style-type: none"> ○ <u>ES&H Manual, Section 4T.</u> ○ <u>DOE Order 440.1A.</u> ○ <u>DOE Manual 470.4-3.</u> ○ <u>10 CFR 851.</u> ● Observe ProForce Training (Square Range shooting and Shoot House).

*GENERAL FIREARMS SAFETY

*Requirements



Members of the Workforce and FAP shall observe the job-specific requirements listed in the following table.

Job Classification or Assignment	Requirements
Managers of organizations utilizing firearms or munitions	<ul style="list-style-type: none"> ● Ensure that a Firearms Safety Plan is developed and approved by SNL and DOE/SSO before beginning any firearms-related activity. This is in addition to existing PHSs or HAs (see "<u>Safety and Risk Analysis</u>" below). The plan must follow ISMS and include provisions for a pre-job safety meeting before any firearms manipulation. ● At SNL/NM and SNL/CA, firearm-related ES&H SOPs shall be developed and approved according to, <u>Chapter 21, "Technical Work Documents (TWDs)."</u> ● Assure that an independent assessment of internal operations is performed annually. Assess all operations involving firearms or munitions, and ensure that associated risks are acceptable and consistent with training and operational requirements. ● Develop CAPs (corrective action plans) to address issues found, and close out on a timely basis. ● Allow only <u>FAP</u> to handle, use, or manipulate <u>firearms</u> or munitions. ● Ensure that FAP handling firearms: <ul style="list-style-type: none"> ○ Comply with all firearms safety policies, rules, and procedures in a manner that ensures the safety of Members of Workforce, contractors, and the public.





- Include emergency response planning during firearms-related activities.
- **Always** follow the four general firearms safety rules:

1. **All** firearms are **always** loaded.
2. **Never** **point a firearm at** anything you are not willing to destroy.
3. Keep your finger off the trigger until your sights are on the target.
4. Be sure of target and what is behind it.

Note: See [Attachment 4T-3](#), "Firearms Safety Rules," for additional information.

- Appoint and fund member(s) of the [Sandia Joint Firearms Safety Committee](#).
- Ensure that all persons involved with firearms receive training necessary to meet their responsibilities.
- Ensure that all firearms are tracked and entered into the Firearms Management System (FMS).
- Ensure that all firearms and firearm-like items are designated and marked appropriately (see [Attachment 4T-4](#), "Firearm and Firearm-Like Item Color Codes").
- Ensure that an annual physical inventory of all firearms is performed.

Note: See CPR400.1.1.40/GN470104, *Firearms Management*, for specific requirements on performing a physical inventory.

Note: At Sandia-controlled premises, firearms that meet the criteria of a destructive device are tracked through the Explosives Inventory System and addressed in CPR400.1.1.31/[MN471011](#), *Sandia Explosives Safety Manual*.

- Ensure that appropriately trained Members of the Workforce (e.g., armorer) perform and document the annual firearm maintenance procedures and inspections in accordance with manufacturers' guidelines.
- Provide developmental and quality assurance activities involving firearms and munitions that are controlled in accordance with the [DOE M 440.1-1A](#), *DOE Explosives Safety Manual*.
- Restrict individuals who may be in a state of mental duress or physical deterioration from participating in any activity involving firearms or munitions.
- Ensure that, upon return to work, FAP who are prohibited from access to firearms or munitions remain restricted until cleared by SNLHealth Services (or site healthcare professional) prior to returning to normal duties. See Chapter 16, "[Health, Benefits and Employee Services](#)," under the topic, "[Return to Work](#)," for more information.
- Maintain training records for FAP. This includes documenting changes of FAP authority revocations, transfers, and re-authorization.



Armorer or [custodians](#)

(Appropriately trained Members of the Workforce), as applicable

- Obtain and maintain training needed to meet their responsibilities as armorers or custodians. (Armorers must obtain and maintain certifications by the [National Training Center \[NTC\]](#) and firearm manufacturers).
- Conduct and document annual firearms inventory and inspection of all firearms.
- Maintain individual records for each firearm to include inspection dates, nature and date of any repair, and records of test firings.
- Have an instruction manual available at each site for each type of firearm that may be used.
- Tag any firearm as "out-of-service" that exhibits an unusual operation, and segregate it from operational firearms until it is certified or recertified as safe to use.
- Inspect and conduct test firings of affected firearms following any unusual operation, occurrence, or [functional repairs](#).
- Verify the integrity of non-standard Research and Development (R&D) modified firearms by remote firing before being hand-fired.
- Follow the requirements outlined in CPR400.1.1.40/[GN470104](#), *Firearms Management*.

Firearms Authorized Personnel (FAP)

- Obtain authorization for firearms use by attending [appropriate training classes](#) and **obtaining** written management approval.
- Maintain firearms safety proficiency and skills by attending the appropriate firearms safety refresher course every 3 years.
- All firearms shall be inspected and tested by a functional check/manipulation prior to issue or use.
- Demonstrate technical and practical knowledge of the contents of instruction manuals for each type of firearm used.
- Wear required personal protective equipment (PPE) during firearms use.
- Immediately report the following to a range officer, controller,
or supervisor:
 - Unsafe acts or conditions as described in [Attachment 4T-3](#), “Firearms Safety Rules.”
 - Injury or illness incurred during all firearms-related activities.
 - Personal condition, such as an illness or use of medication, that could affect ability to handle firearms safely.



Emergency Response

During firearms-related activities that involve remote operations, training, or testing, where there is a potential for a delay in emergency response:

- Ensure that there is a minimum of two (2) redundant forms of electronic communication (i.e., radio) or telecommunication (i.e., cell phone) available.
- Inform participants of available communication **devices**, their location, and function.
- Test various methods of communication before starting activity.
- Provide emergency personnel trained in:
 - Cardiopulmonary resuscitation (C.P.R).
 - First aid/major trauma (i.e., gunshot wounds).
 - [Bloodborne pathogens](#).

Note: See CPR400.1.1.19/[GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan*, for specific training requirements.

Members of the Sandia Joint Firearms Safety Committee (collectively)

- Assist Sandia organizations in ensuring firearms operations are performed in a safe manner and in compliance with all DOE firearms safety requirements.
- Host/participate in annual Internal Firearms Safety [Appraisals](#) at SNL/NM, SNL/CA, and TTR according to the procedures in [Attachment 4T-1](#), "Conducting Internal Firearms Safety Appraisals."

Firearms SME



- Assist in developing and approving plans and procedures according to [DOE M 470.4-3, Protective Force](#).
- Maintain this section.
- Assist in appraisals, self-assessments, and other requests as needed.
- [Maintain firearms expertise by attending required firearms training](#).

USE OF FIREARM-LIKE ITEMS

Requirements



Managers shall be responsible for ensuring that:

- A safety plan is developed for the use of [firearm-like items](#) that includes:
 - Required markings.
 - Appropriate postings.
 - Personal protective equipment (PPE).
 - Appropriate notifications to ProForce prior to use.

Note: This notification is to warn the ProForce that the items will be out of storage and are being handled or manipulated.

- Training requirements for Members of the Workforce.
- Firearm-like items are stored and secured so they are not accessible to



unauthorized persons.

- An accurate running inventory is kept to include the following information for firearm-like items:
 - Type
 - Manufacture
 - Location
 - Number



Note: [Attachment 4T-4](#), “**Firearm and Firearm-Like Item Color Codes**,” provides information on color-coding. The blue and the orange color-coded items are firearms. As such, these firearms are included in the annual physical inventory.

Members of the Workforce shall use, handle, or manipulate firearm-like items as a real firearm (see [Attachment 4T-3](#), “Firearm Safety Rules”).

*REPORTING

*Requirements

Members of the Workforce who witness any of the following circumstances shall report the situation as indicated:

Circumstance	Reporting Requirement



- Unusual or unsafe acts, conditions, or operations involving [firearms](#), or munitions, to include firearms-related injuries.
- Inventory discrepancies.
- Unauthorized discharge (UD) of firearms (defined in [DOE M 470.4-7](#) as “the discharge of a firearm under circumstances other than (1.) during firearms training with the firearm properly pointed down range [or toward a target] or (2.) the intentional firing at a hostile party when deadly force is authorized by 10 CFR 1047.7”).



Report immediately to **one of the following:**

- Manager,
- Supervisor, **or**
- Range officer.

Follow the requirements of [Section 18C](#), "Occurrence Reporting," and (if applicable) [Attachment 4T-2](#), “Checklist for Unauthorized Discharges (UDs).”

Members of the Workforce who serve in a supervisory position shall, upon receiving a report of unusual or unsafe acts or conditions:



- Take the necessary corrective actions to render the situation safe.
- Submit reports as the situation dictates and in accordance with applicable CPRs.

Note: See [Section 18C](#), "Occurrence **Reporting**," for additional requirements.

*SAFETY AND RISK ANALYSIS

*Requirements

Managers shall be responsible for ensuring that:

- A **Firearms Safety Plan that includes** a safety analysis, safety assessment, or risk analysis for all facilities, operations, and activities involving the use, transportation, or storage of **firearms** or related **munitions** is **developed**. The type and depth of analysis depends on the level of hazards present (consult with the **firearms SME** or the appropriate **Division ES&H Team** for assistance with such determinations). **The Firearms Safety Plan is needed even when a PHS and HA already exists.**

Note: For additional information, see [Chapter 13](#), “Hazards Identification /Analysis and Risk Management.”

- **Firearms Safety Plan and** analysis reports are submitted to the **DOE-SSO and SNL firearms SME** for approval before implementing any new firearms or munitions operations, training, or activities.

*PERSONAL PROTECTIVE EQUIPMENT (PPE)

*Requirements

Members of the Workforce shall:

- Wear the following appropriate personal protective equipment (PPE) when exposed to any shooting hazards (i.e., noise, flying particles, lead):
 - Eye protection (**see ANSI Z87.1-2003, Occupational and Educational Personal Eye and Face Protection Devices**).
 - Hearing protection: **dual hearing protection (ear muffs and ear plugs) is required for certain activities. (See SNL Operating Procedure, “Protective Force Program: Impact and Impulse Noise Implementation Guidelines, SNL/**

NM Hearing Conservation Program.” Also see [Section 6H](#), “Noise Exposure and Hearing Conservation”).

- Clothing that is appropriate for the conditions. For example, gloves or other forms of protection (**such as** aprons) appropriate for the solvents being used when cleaning firearms.

Note: Review [Section 4L](#), “Personal Protective Equipment (PPE),” **and** the corresponding MSDS sheet for proper selection of PPE.



LOADING AND UNLOADING OF FIREARMS

Requirements

Managers shall ensure that instructions for the loading and unloading of each type of firearm are accessible or posted at every designated firearm loading/unloading area(s).

Appropriately trained Members of the Workforce shall load and unload all [firearms](#) only in a safe and approved area or pointed toward a bullet containment device.

EXPOSURE TO HAZARDOUS MATERIAL AND ENVIRONMENTS



Requirements

Managers who oversee the use, handling, storage, or transportation of firearms or munitions shall ensure that:

- Members of the Workforce are protected from exposure to lead by maintaining airborne lead levels below 30 micrograms of lead per cubic meter of air (30 ug/m³), averaged over an 8-hour workday.
- [Material safety data sheets \(MSDSs\)](#) for each hazardous material associated with

the use, cleaning, and handling of firearms or munitions are readily available for review at each location where the hazardous material is used.

- Members of the Workforce who are or may be exposed to noise levels at or above 85 decibels (dB) averaged over eight working hours or an 8-hour time-weighted average:
 - Enroll in a Sandia hearing conservation program.
 - Receive an audiogram and training on the effects of noise, hearing loss protective measures, and the correct use of hearing protection on an annual basis.

Note: See [Section 6H](#), “Noise Exposure and Hearing Conservation,” for additional information. Also see [SNL Operating Procedure, “Protective Force Program: Impact and Impulse Noise Implementation Guidelines, SNL/NM Hearing Conservation Program.”](#)

Members of the Workforce shall:

- Wash their hands before and after using, cleaning, or handling firearms or munitions.
- [Treat](#) contaminated rags and other firearm cleaning materials [as](#) hazardous waste and [dispose of these materials](#) as appropriate. See [Section 19A](#), “Hazardous Waste Management,” for additional guidance.

INFLUENCE OF DRUGS AND ALCOHOL

Managers shall:

- **Not** allow Members of the Workforce or visitors under the influence of drugs, alcohol, prescription medication, or over-the-counter medications that may affect physical or mental abilities to handle, transport, use, or carry [firearms](#) or munitions.

Note: See Chapter 15, “Emergency Preparedness and Management,” [Attachment 15-1](#), “What to Do During an Emergency,” and Chapter 16, “[Health](#), Benefits and

Employee Services,” under the topics, “[Fitness for Duty](#),” and “[Substance Abuse Monitoring](#),” for additional guidance.

- Ensure that supervisors and FAP receive **Sandia-required** training on how to identify individuals who may be under the influence of drugs, alcohol, or medications, and display other forms of aberrant behavior.

Members of the Workforce shall not participate in handling, transporting, carrying, or using firearms or munitions while using or under the influence of drugs, alcohol, or medications (prescription or over-the-counter) that may affect mental or physical abilities.

*STORAGE AND TRANSPORTATION OF FIREARMS AND MUNITIONS

*Requirements

Onsite and Offsite Storage

Managers shall be responsible for ensuring that all the following provisions for storage of firearms and munitions are followed:

- Site-specific plans or [procedures](#) for the safe storage of [firearms](#) and [munitions](#) are developed and comply with the requirements in CPR400.1.1.31/[MN471011](#), *Sandia Explosives Safety Manual*, and [DOE M 470.4-3](#), *Protective Force*. This information shall be included in the Firearms Safety Plan.

Note: See [Chapter 21](#), “Technical Work Documents (TWDs),” for additional information on developing procedures and other TWDs.

- Firearms are stored so they are not accessible to unauthorized persons.
- Firearms, ammunition, pyrotechnics, and explosives are stored in GSA-approved firearms storage containers or containers approved by the SJFSC that are bolted or otherwise secured to the structure or under alarm coverage.



Note: Where the weight of the storage container would deter removal of the container, **it is not necessary to** bolt or secure the container.

Note: Firearms not in such containers or under alarm coverage are locked in racks, chained, or cabled to prevent easy, rapid, unauthorized removal.

- Store firearms with another organization that has an approved structure or an authorized storage facility when their organization does not have appropriate firearms storage containers or facilities.
- Potted and welded firearms, which do not require VTR or GSA-safe storage, are stored in locked containers.



- Locks or combinations are changed when:
 - Members of the Workforce having access to keys or combinations no longer require them.
 - Members of the Workforce having keys or combinations transfer or terminate.
 - A lock or other part of a safe has been repaired or otherwise worked on.
 - Keys or combinations have been compromised.
- Special approval from the Sandia National Laboratories Joint Firearms Safety Committee (SJFSC) is obtained for facilities not listed as authorized storage facilities (see "[Authorized Storage Facilities](#)").




- Privately-owned and personally-owned firearms are not allowed on DOE and Sandia-controlled premises without prior written approval from the director of the ProForce Organization.

Note: This provision allows commercial suppliers to bring firearms and munitions to DOE and Sandia-controlled premises for demonstration purposes. It is not intended as a means to allow personally-owned firearms and munitions to be brought on to DOE or Sandia-controlled premises for any purpose.

Members of the Workforce shall:

- **Not** store firearms or ammunition in the same container with classified matter or ammunition.

 **Note:** If ammunition is stored in the same container as a firearm, the ammunition should be within a separate lockable container or compartment.

- **Not** leave unsecured firearms unattended.
- Return or surrender all issued keys to firearms storage repositories to the responsible manager in accordance with [CPR400.3.15](#), *Locks and Keys*, upon re-assignment, transfer, or termination.

Firearms custodians shall:

- Restrict keys and combinations to firearms storage containers to **themselves, their alternates**, their managers, or a designated team supervisor.
- Ensure that all DOE firearms assigned to their organization are listed on Sandia's property inventory list.

Authorized Storage Facilities


Requirements

Managers shall ensure that firearms are **only** stored, transferred to, and maintained in storage facilities that are authorized by the SJFSC.

Note: A list of authorized storage facilities may be obtained from the [firearms SME](#) or the [Safety Engineering](#) manager.

Onsite Transportation

Requirements

 Managers shall be responsible for ensuring that during transportation activities on site, all the following provisions for the movement of firearms and munitions are followed:

- Site-specific plans that include procedures for the safe transportation of firearms and munitions are developed and comply with the requirements in CPR400.1.1.31/_

[MN471011](#), *Sandia Explosives Safety Manual*, and [DOE M 470.4-3](#), *Protective Force*.

Note: See [Chapter 21](#), “Technical Work Documents (TWDs),” for additional information on developing procedures and other TWDs.

- Firearms are handled or transported by FAP only.
- Firearms are transported only in government vehicles.
- Ammunition is segregated from firearms during transportation and kept in the original or metal ammunition containers.
- Firearms and munitions are stored in accordance with this section and Sandia’s munitions storage practices (consult the [explosives contact](#)).
- Large quantities (other than daily use) of ammunition or pyrotechnics are transported in accordance with Sandia’s internal explosive movement procedures as described in CPR400.1.1.31/[MN471011](#), *Sandia Explosives Safety Manual*, under Section 8.5S, “Site Responsibilities.”

Members of the Workforce shall:

- Verify that all firearms are unloaded prior to transport.
- Not leave firearms unattended or unsecured.
- Always secure firearms when not in use.

Guidance

While on site, firearms should be transported with trigger locks/trigger lock cable mechanisms or in a lockable sturdy container meeting DOT requirements.

Offsite Transportation

Requirements

During transportation activities off site, managers shall be responsible for ensuring that

the following provisions for storage and transportation are followed:

- All firearms are verified as unloaded and equipped with trigger locks or placed in a locked container.
- Follow DOT shipping requirements for moving firearms or ammunition. Contact Shipping and Receiving (using [WebShipper](#)) for specific requirements.

ACQUISITION OF FIREARMS AND MUNITIONS

Requirements

Members of the Workforce shall:

- Obtain the appropriate level of authorized management approval prior to acquiring any firearm or munitions.
- Follow the established requirements in CPR400.1.1.40/[GN470104](#), *Firearms Management*.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Noise exposure and hearing conservation	Section 6H , "Noise Exposure and Hearing Conservation"
Personal protective equipment (PPE)	Section 4L , "Personal Protective Equipment (PPE)"
Hazardous waste management	Section 19A , "Hazardous Waste Management"
Occurrence reporting	Section 18C , "Occurrence Reporting"

Health services and returning to work	Chapter 16 , "Health, Benefits, and Employee Services"
Emergency preparedness	Chapter 15 , "Emergency Preparedness and Management"
Technical work documents	Chapter 21 , "Technical Work Documents (TWDs)"
Root cause analyses	Section 22B , "Root Cause Analysis (RCA)"

*REFERENCES

*Requirements Source Documents

[10 CFR 851](#), *Worker Safety and Health Program*.

[29 CFR 1910](#), *Occupational Safety and Health*.

[DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*.

[DOE M 440.1-1A](#), *DOE Explosives Safety Manual*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

[DOE M 470.4-3](#), *Protective Force*.

[DOE O 470.4](#), *Safeguards and Security Program*.

[SNL, CPR001.1](#), *Corporate Business Rules System Standard*, Section 3.7, "Exceptions to Corporate Business Rules."

[SNL, CPR400.1.1/MN471001](#), *ES&H Manual*:

- [Section 4L](#), "Personal Protective Equipment."

- [Section 6H](#), “Noise Exposure and Hearing Conservation.”
- [Chapter 13](#), “Hazards Identification/Analysis and Risk Management.”
- [Chapter 15](#), “Emergency Preparedness and Management.”
- [Chapter 16](#), “Health, Benefits, and Employee Services.”
- [Section 18C](#), “Occurrence Reporting.”
- [Chapter 19A](#), “Hazardous Waste Management.”
- [Chapter 21](#), “Technical Work Documents.”



SNL, [CPR400.1.1.19/GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan*.

SNL, [CPR400.1.1.31/MN471011](#), *Explosives Safety Manual*.

[CPR400.1.1.40/GN470104](#), *Firearms Management*.

SNL, [CPR400.3.15](#), *Locks and Keys*.

Implementing Documents

[DOE M 470.4-7](#), *Safeguards and Security Program References*.

[DOE STD 1091-96](#), *Firearms Safety*.

SNL, [CPR400.1.1/MN471001](#), *ES&H Manual*, [Section 22B](#), “Root Cause Analysis.”

SNL, [Firearms Management System website](#).

SNL, Operating Procedure, “Protective Force Program: Impact and Impulse Noise Implementation Guidelines, SNL/NM Hearing Conservation Program.”

Related Documents

[10 CFR 1046](#), *Physical Protection of Security Interests*.

[10 CFR 1047](#), *Limited Arrest Authority and Use of Force by Protective Force Officers*.

[29 CFR 1926](#), *Safety and Health Regulations for Construction*.

[42 USC 2011](#) *et seq.*, *Atomic Energy Act of 1954 (AEA)*, as amended.

ANSI Z87.1-2003, *Occupational and Educational Personal Eye and Face Protection Devices*.

ANSI Z136.1 - 2000, *Safe Use of Lasers*.

ANSI Z136.6 - 2005, *Safe Use of Lasers Outdoors*.

[DOD 6055.9-STD](#), *DOD Ammunition and Explosives Safety Standards*.



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ES&H Manual

SECTION 6M - SAFETY SHOWERS AND EYEWASHES

Subject Matter Expert: [Anna Lee](#); CA Counterpart: [Al Buerer](#)

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Administrative Changes: February 23, 2001, April 2, 2004, and [October 24, 2005](#)

* Indicates a substantive change

- [Applicability](#)
 - [*Safety Showers and Eyewashes](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:


- Sandia [employees](#).
- Sandia contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to the use of safety showers and eyewashes at [Sandia-controlled premises](#).

*SAFETY SHOWERS AND EYEWASHES


Requirements

Managers shall:

- 
- Provide suitable facilities for emergency quick drenching or flushing of the eyes and body in workplaces where Members of the Workforce may be exposed to injurious, [corrosive material](#).
 - Ensure that no electrical outlets are located within 3 feet of the vertical axis of a safety showerhead. Electrical outlets located from 3 to 6 feet of the vertical axis of a safety showerhead are required to be Ground Fault circuit Interrupter (GFCI) outlets.

Guidance

Managers should ensure that safety showers and eyewashes are:

- 
- Positioned 100 feet or less from the hazard and located in accessible areas that can be reached in 10 seconds or less.
 - Labeled with a highly visible sign.
 - Illuminated with proper lighting.

Managers should also ensure that:

- Members of the Workforce who might be exposed to a chemical splash receive site-specific training on the proper use of safety showers and eyewashes.
- [Plumbed eyewash units](#) and plumbed emergency showers are activated once a week to flush lines, verify operation, and reduce the possibility for growth of potentially harmful bacteria and amoeba.
- Self-contained and [personal eyewash units](#) are inspected according to manufacturer's instructions.

Members of the Workforce should contact their [Division ES&H Team](#) for assistance with questions regarding safety showers and eyewashes.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Corrosives	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Responding to accidents and injuries	Chapter 16 , "Health, Benefits, and Employee Services"
Procedures for reporting occurrences	Section 18C , "Occurrence Reporting"

*REFERENCES

Requirements Source Documents

[29 CFR 1910.151](#), *Medical Services and First Aid*.

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [CPR400.1.1](#), *MN471004, Electrical Safety Manual*.

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

ANSI, Z358.1-1990, *Emergency Eyewash and Shower Equipment*.



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ES&H Manual

*ATTACHMENT 6V-6 - USING VIDEO DISPLAY TERMINALS (VDTs)

Subject Matter Expert: [Mark Warner](#); CA Counterpart: [Dan Kuey](#)

MN471001, Issue A

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Administrative Changes: February 23, 2001, April 2, 2004, and [October 10, 2005](#)

Distance of Monitor from Eyes

Blurred vision, eye strain, and headaches have all been associated with prolonged video display terminal (VDT) use. The viewing distance (length from the eyes to the document or screen) can be a contributing factor. The distance from the eyes to the surface of any VDT screen should never be less than 12 inches. Comfortable viewing distance is a function of not only the size of the displayed characters, but also the lighting, glare, and the worker's ability to maintain focus. At a 24-inch distance, characters on a color VDT should be at least 0.14 inches high for workers with average visual acuity.

Placement of Document Relative to Monitor

To avoid constant changes of focus, the screen and document holder should be at the same distance from the eyes, and they should be close together to avoid neck pain associated with excessive back and neck movement. The incline of the document holder and monitor should be adjusted to an angle that is near perpendicular to the line of sight.

In many cases, a document holder can be attached to the side of the monitor to keep documents next to the screen and to free up desk space. For touch typists, who check the monitor only occasionally, it sometimes makes more sense to put the document holder directly in front of the keyboard and the monitor off to one side.

Monitor Height and Angle

General

It is advisable to set the height of the monitor and reference document so that the top of the display surface is at or just below eye level. The natural line of sight is about 15 degrees below horizontal. Monitors are often set much above this. Looking up or down too much can strain the eyes and/or the neck muscles.

Bifocal Wearers

Bifocal wearers may prefer to have their screens more steeply tilted or to position their screens lower to avoid tilting their heads back. Tilting the head back to read the screen through bifocals may contribute to neck strain. Bifocal wearers and users who are concerned about their glasses should ensure their eye prescription has been issued within two years. If the prescription is:

- **More than** two years old, it is advisable to obtain a prescription from a personal optometrist or ophthalmologist.
- **Less than** two years old, bifocal wearers may go to the appropriate medical facility for a visual screening and information on getting glasses for viewing a video display terminal (VDT). These "task" glasses are prescribed specifically for the distance from the eyes to the VDT.

Glare and Lighting

Glare can contribute to vision problems. Direct glare is caused by light sources within the visual field, (i.e., windows) while reflected glare is typically caused by reflections of lights and windows on the video display terminal (VDT) screens.

Control of Window Glare

To control screen glare from windows, windows should be covered with drapes or blinds to limit direct sunlight (vertical blinds are best) and the monitor should be turned so the screen is perpendicular (90 degrees) to the windows. The VDT may also be arranged so that the window is not behind the seating position.

Control of Overhead Light Glare

Consider the following techniques to control the glare from overhead lights:

- Tilt the monitor so that it does not reflect the light. This would be roughly perpendicular (90 degrees) to the surface on which it sits.
- In specialized applications, install hoods over screens to shield them from direct or reflected light.
- Use indirect lighting, task lighting, or parabolic louvers if possible. >
- Lower overall light in the room to half of normal.
- Use black letters on white backgrounds on VDT screens.
- When possible, ensure that walls, equipment, and material near the VDT do not contribute to glare.
- If the other methods are ineffective, install a glare screen on the monitor. The micro-mesh type is considered the best for monitors with polished glass. The monitor brightness and contrast may need to be adjusted after installing the glare screen.

Eye Strain Reduction Measures

To reduce eye strain, consider the following:

- Clean the screen or glare filter regularly to remove dust, grime, and fingerprints.
- Ensure that characters on the screen are clear and stable. If they are blurry or flickering, contact a computer technician.
- Set the brightness level on the monitor low and the contrast high to achieve crisp letters against a contrasting background.

Resting the Eyes

Video display terminal (VDT) operators may experience eye strain from high visual demands. Contact lens wearers are especially subject to eye strain because people tend to blink less while concentrating on VDT tasks, which may cause their eyes to become overly dry. Alleviate strain on eyes by:



- Taking "eye breaks" several times an hour by focusing on objects at least 20 feet away. For example, a VDT operator should work at the keyboard for 20 minutes and then take an "eye break" for at least 20 seconds (referred to as the "20/20 rule").
- Closing the eyes for at least five seconds several times an hour.

Eye Examinations and Prescriptions

It is important to have adequately corrected vision for video display terminal (VDT) work. The American Optometric Association recommends that VDT operators have semiannual vision examinations by a licensed optometrist or ophthalmologist who is familiar with the visual demands of VDT work.



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ES&H Manual

SECTION 10A - PRESSURIZED DRUMS

Subject Matter Expert: [Danny Donald](#); CA Counterpart: [Janet Harris](#)

Contributor: [Roger Shrouf](#)

MN471001, Issue B

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* Indicates a substantive change



- [Applicability](#)
- [Determining if a Drum is Safe to Open](#)
- [Opening a Pressurized Drum](#)
- [Ordering Lids For Open-Head Drums](#)
- [Related Hazards and Activities](#)

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to all **Members of the Workforce whose activities involve the use of sealed [drums](#) (tight/open-head, poly, or steel).**

Note: Internal [pressure](#) build-up may present a hazard regardless of whether the drum contains liquids, solids, waste, or other material, or the drum is new, never-been-used, and empty.

Note: Drums used to store hazardous waste are required to be closed at all times unless waste is to be added or removed. See [Section 19A](#), "Hazardous Waste Management."



DETERMINING IF A DRUM IS SAFE TO OPEN

Requirements

Members of the Workforce shall consider all sealed [drums](#) to be under [pressure](#), particularly those containing volatile organics, aqueous/organic mixtures, low or high pH solutions, biological wastes, or sludge, unless it is known that drum pressure has been vented.

Members of the Workforce shall determine if a drum is pressurized by visual observations, checking available documentation, and by checking the following before loosening the lid, venting, or opening the drum:

- Are the contents inert (non-reactive)?
- Is the drum composition compatible with the contents?
- Is the drum top or sides bulging or rusted?
- Was the drum stored under appropriate conditions (i.e., out of the sun and not subjected to severe weather or high temperatures)?

Note: Checking these items does **not** guarantee that a drum is un-pressurized and safe to open. Chemical/biological content reactions, temperature changes, and altitude changes can cause a pressure build-up. The potential for pressurization increases if the drum is exposed to direct sunlight or high temperatures, is vigorously or frequently moved or disturbed, or is stored for a long time.

Members of the Workforce, upon identifying a pressurized drum, shall **stop** the activity



and do one of the following:

- Comply with the appropriate organization's approved drum-handling [technical work documents \(TWDs\)](#).
 - Request assistance from the appropriate [Division ES&H Team](#) and notify the appropriate manager.
-

OPENING A PRESSURIZED DRUM

Guidance


Members of the Workforce should use the following safety precautions when opening a [drum](#):

- Work in pairs.
- Check that the drum is in an upright position before performing any other activity to prevent the contents or residue from being spilled.
- When the drum is so fitted, open the [drum faucet](#) to relieve the [pressure](#). Note that the drum faucet and attachments must be positioned in such a way that the contents are captured and not allowed to spill.
- When applicable, loosen the smallest [bung](#) to equalize the pressure.

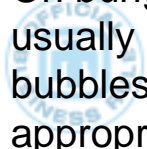
Note: The bungs have only three threads and may be expelled by pressure if loosened too much.

- Wear necessary [personal protective equipment \(PPE\)](#) (e.g., face shields for liquids, gloves, respirators, and aprons).
- Remove all items from the top of the drum before attempting to remove the lid. This will prevent the items from potentially becoming projectiles.
- Cover the drum with [drum webbing](#), netting, or other equivalent devices to restrain

flying lids. See the [pressurized drum contact](#) for recommendations.

- 
- When removing lids from open-head drums (those equipped with locking rings), slowly loosen the locking ring bolt and then break the seal allowing it to vent slowly. Breaking the seal may require tapping on the lid/seal with a hammer. Use a non-sparking hammer when working with flammable vapors/gases.
 - Ensure that personnel are positioned to the side of the drum, away from the ring clamp and the lid or bung.
 - Look away when breaking seals.
 - After pressure is relieved, consider using a [drum ring snapper tool](#) to remove the [drum ring](#) and lid.

Note: Sealed 5-gallon [pails](#) should be approached cautiously as they may present hazards similar to those described above.



On bung-type lids, Members of the Workforce may loosen the smallest bung (this is usually 3/4" pipe threads) and apply a soap solution on the bung to check for pressure. If bubbles are observed, **stop** the activity and notify the responsible manager or appropriate [Division ES&H Team](#). When using the soap method for pressure checking, Members of the Workforce should:

- Only use a soap solution if it will not react with the contents of the drum.
- Be aware that the presence of bubbles could indicate either, or both, pressure and leakage. No bubbles means only that there's no leakage, but there could still be pressure.

ORDERING LIDS FOR OPEN-HEAD DRUMS



Guidance

When ordering lids for open-head [drums](#), Members of the Workforce should purchase drum lids that are fitted with:

- [Bungs](#).
- A [safety drum vent](#) that limits internal drum [pressure](#) to that set by the device, typically 5 psig.

Note: Drums having a safety drum vent may be considered an open container for transport, See the [shipping team](#) contact for information prior to making a shipment.



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to the use of [drums](#) include:

Hazard/Activity	Reference
Release of hazardous material	Section 6K , "Miscellaneous Industrial Hygiene Topics" Section 18E , "Environmental Release Reporting"
Release of radioactive material	Chapter 8 , "Occupational Radiation Protection" Section 18E , "Environmental Release Reporting"
Non-emergency injuries and illnesses	Chapter 16 , "Benefits and Health Services"
Steel drum manufacturing	ANSI MH2-1997, <i>American National Standard For Steel Drums and Pails</i>

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Corporate Process Requirement No: CPR400.1.1
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 IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia National Laboratories Internal Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 3 – OFFICE SAFETY

Subject Matter Expert: [Mark Warner](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue E

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Review Date: August 2, 2006

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*Indicates a substantive change

- [Applicability](#)
 - [Office Hazards](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities in an office environment.

OFFICE HAZARDS

Guidance

Members of the Workforce should see the following chapters and sections for requirements and guidance regarding hazards found in the office environment.

Hazard/Activity	Reference
Building environment, such as indoor air quality, heating, and cooling	Section 6R , "Indoor Air Quality"
Electrical hazards	Section 4B , "Electrical Safety Practices"
Emergency response and egress routes	Chapter 15 , "Emergency Preparedness and Management"
Housekeeping practices	Section 4P , "Housekeeping"
Injury and illness reporting	Chapter 16 , "Health, Benefits, and Employee Services"
Life Safety Code issues, such as egress routes, fire extinguishers, exit signs, and space heaters	Chapter 5 , "Fire Protection"
Medical services	Chapter 16 , "Health, Benefits, and Employee Services"
Non-hazardous waste disposal	Section 4P , "Housekeeping" Section 19F , "Other Waste" [Management]
Office ergonomics	Section 6V , "Ergonomics"
Sanitation, including eating and drinking	Section 6L , "Eating and Drinking"

Walking and working surface issues, such as torn carpeted floors and slippery floors

[Section 4P](#), "Housekeeping"

Space owners should assess their office spaces to identify hazards and activities that are not consistent with office occupancy per [Section 22A](#), "ES&H Line Self-Assessment Activities."

Members of the Workforce should see the following chapters and sections for requirements and guidance regarding potential hazards in the office environment.

Hazard/Activity	Reference
Chemicals, such as janitorial supplies	Section 6D , "Hazard Communication Standard"
Electrical work	Section 4B , "Electrical Safety Practices"
Explosives	Chapter 9 , "Explosives Safety"
Firearms	Section 4T , "Firearms Safety"
Hazardous waste	Chapter 19 , "Waste Management"
Industrial hygiene - Hazardous materials or chemicals	Chapter 6 , "Industrial Hygiene"
Industrial machine and portable power tool use	Section 4N , "Industrial Machine and Portable Power Tool Safety"
Industrial safety	Chapter 4 , "Industrial Safety"
Pressure safety operations	Section 4D , "Pressure Safety Operations"
Radioactive materials	Chapter 8 , "Occupational Radiation Protection"

Note: Other office safety guidance will be maintained on the [Office Safety](#) web site.

REFERENCES

Related Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

 SNL, *Noncompliance Report - Loss of Control of Radioactive Materials*, NTS-ALO-KO-SNL-NMSITE-2000-0003.

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SECTION 4G – FALL PREVENTION/FALL PROTECTION

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* Indicates a substantive change

- [*Applicability](#)
- [Training](#)
- [*Fall-Prevention/Fall-Protection Procedures](#)
- [*Performing Elevated Work on Roofs and Rolling Stock](#)
- [*Using Fall-Protection Equipment](#)
- [*Maintaining and Storing Personal Fall-Arrest Systems](#)
- [Related Hazards and Activities](#)
- [*References](#)
- Attachments
 - [*4G-1 - Fall Protection Equipment, Components & Fall Clearance Calculations](#)
 - [*4G-2 - Suspension Trauma/Orthostatic Intolerance](#)
 - [*4G-3 - Rolling Stock](#)
 - [*4G-4 - Service Life for Personal Fall Arrest Systems](#)
 - [*4G-5 - Fall Prevention/Fall Protection Decision Flowchart](#)
- Forms
 - [*SF 2001-FPC, Fall-Protection Work Planning Checklist](#) ([Word file](#)/[Acrobat file](#))



- *SF 2001-FPE, Fall Protection Equipment Checklist ([Word file/Acrobat file](#))

*APPLICABILITY

For purposes of this document, Members of the Workforce (MOW) are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to MOW whose activities include an exposure to fall hazards at levels higher than 4 feet above ground or floor levels on [Sandia-controlled premises](#).

Note: This height requirement may change due to local regulations. Contact your line support Safety Engineer for clarification. This section applies to all activities performed at [Sandia-controlled premises](#) where Members of the Workforce are exposed to fall hazards at levels higher than 4 feet above ground or floor levels.

Exception

The provisions of this section do not apply when MOW are making an inspection, investigation, or assessment of workplace conditions prior to the actual start of work activities or after all work activities have been completed. This exception to work activities does not give MOW authority to perform work in an unsafe manner or jeopardize safety. Exercise extreme care and good judgment at all times.

TRAINING

Managers shall ensure that MOW exposed to fall hazards meet the training requirements specified in the table below:

Work Activity or Role	Required	Recommended

MOW who are exposed to fall hazards (see note 1)	FPP105 (Awareness Training) (refresher training required every 3 years) FPP110 (Competent Person Training) (refresher training required every 3 years)	N/A
--	--	-----

¹Retraining takes place every 3 years, or sooner if:

- The trained individual does not have the understanding and skill needed to work safely.
- Changes in the workplace, **or workplace conditions**, render previous training obsolete.
- Changes in types of fall-arrest systems or equipment render previous training obsolete.

Guidance

MOW who complete fall-prevention and fall-protection training should be able to:

- **Plan their work.**
- Identify potential fall hazards **associated with the work activity**.
- Control fall hazards **using** fall-prevention or fall-reduction equipment.
- Select appropriate equipment for particular work environments.
- Demonstrate proper fall-protection equipment inspection techniques.
- Locate and use proper anchorage procedures.
- Demonstrate donning, adjustment, and proper fit of a full-body harness (FBH).
- Experience the need for proper adjustment of a FBH while being suspended.
- Follow fall-protection procedures to minimize fall hazards.

*FALL-PREVENTION/FALL-PROTECTION PROCEDURES

Requirements

Managers shall be committed to the elimination of fall hazards and shall ensure MOW not perform work if exposed to a fall hazard.

A technical work document (TWD) shall cover all work requiring the use of fall prevention/fall protection procedures or equipment (for guidance, refer to the checklist SF 2001-FPC [\[Word file/Acrobat file\]](#)). Utilize the "Hierarchy of Fall Protection" when developing elevated work plans (TWDs). The TWD includes, but is not limited to, the following information and instructions:

- Eliminating fall hazards.
- Preventing fall hazards by guarding.
 - Arresting falls (PPE).
 - Applying administrative techniques.
 - Training requirements.
 - Activity to be performed (**Not perform work when exposed to a fall hazard**).
 - Mobility required.
 - Workplace conditions.
- Hazards that may be encountered during an activity.
- Types of equipment required for each task to be performed at elevated levels. (Calculate "Fall clearance distances" when needed)

- Competent person reviews and makes equipment recommendations.
- Limiting conditions that will require stopping work.
- Rescue plans that address the following:
 - Availability of rescue personnel and equipment (e.g., ladders)
 - Assurance that users of fall-protection equipment can be rescued within 15 minutes or can rescue themselves (i.e., self-rescue).
 - [Use of self-rescue equipment](#) (e.g., a shock-absorbing lanyard with a built-in self-rescue ladder).

Note 1: For information on orthostatic intolerance issues related to prolonged suspension in fall-protection equipment, refer to [Attachment 4G-2](#), “Suspension Trauma/Orthostatic Intolerance.”

Note 2: Refer to [Attachment 4G-1](#), “Fall Protection Equipment, Components & Fall Clearance Calculations.”

Guidance

During the planning process, Managers and MOW should consider all methods of avoiding/controlling exposure to fall hazards.

*PERFORMING ELEVATED WORK ON ROOFS AND ROLLING STOCK

Utilize the following when working on roofs:

- Get permission and gain access to a building’s roof by using the [appropriate roof access process](#).
- Consider these additional concerns and health hazards while working on roofs: chemicals, magnetic fields, ionizing and non-ionizing radiation, skylights, weather,



communication, etc.

- For fall hazard exposures 6' or less from an unprotected side, edge, or hole on low sloped roofs (< 4/12 slope), MOW shall use guardrail systems, safety net systems, personal fall arrest systems, or some other method that will provide equivalent protection. For guidance, refer to [Attachment 4G-5](#), "Fall Prevention/Fall Protection Decision Flowchart."
- For fall hazard exposures between 6'-15' from unprotected side, edge, or hole on low-sloped roofs (< 4/12 slope), follow the requirements set forth by OSHA 1926.500. MOW shall be protected from falling by using guardrail systems, safety net systems, personal fall arrest systems, or a combination of a warning line system and a guardrail system; a warning line system and a safety net system; a warning line system and a personal fall arrest system; or a warning line system and a safety monitoring system. For roofs 50-feet (15.25 m) or less in width, the use of a safety monitoring system alone [i.e., without the warning line system] is permitted. (refer to [Subpart M, Appendix A](#) of OSHA 1926.500).
- For fall hazard exposures greater than 15' from unprotected side, edge, or hole on low sloped roofs (< 4/12 slope), consider the following administrative controls or develop an equivalent fall protection plan that has been reviewed and approved by a "fall protection competent person." These fall protection administrative controls allow MOW to work on some of SNL's large, low-sloped roofs without conventional fall protection devices if the work is greater than 15' feet from an unprotected side, edge, or hole. and if no additional hazards have been identified. OSHA states "Distance alone is ineffective to protect workers from unprotected side, edge, or hole." Work on unprotected low-sloped roofs shall be allowed without [conventional fall protection](#) under the following conditions:
 1. MOW develop a work plan that addresses fall hazards, describes the worker and safety monitor fall protection duties, and uses designated safe work zones. All affected MOW shall sign the work plan acknowledging responsibilities and training requirements.
 2. Only for other than traditional "construction" type work, (e.g. roofing repairs, heating and a/c, and electrical maintenance, R&D work, of a temporary nature etc.) on low-sloped roofs (< 4/12 slope).
 3. A safe work area on the roof must be designated by:



- Warning lines, which are used without a monitor, where the warning lines are at least 15 feet back from the unprotected edge and all of the following are met:
 - A warning line is used 15 feet or more from the edge (or nearest edge of a hole);
 - The warning line meets or exceeds the requirements in §1926.502(f)(2);
- “Marking” the area by some method including painting, tape, or chalk. (Caution: some chemicals may react with roofing membranes and cause damage. Contact building manager for advice).

4. There must be at least two people in the work area, one person designated as the “Safety Monitor,”

5. The trained “Safety-monitor” must keep him/herself and other MOW within the designated safe work zone and greater than 15’ from the edge.

6. Safety-monitor has no other duties other than being a “safety monitor”.

7. No work or work-related activity is to take place in the area between this designated safe work area and the fall hazard.

8. MOW are prohibited from going past the designated safe work area delineation (marking/warning lines).

9. MOW are **not** exposed to any fall hazards (closer than 15’ in any direction) while working or accessing the work area.

10. MOW remain on the horizontal surfaces of the roof (not elevated) (< 4/12 slope).

11. MOW have and maintain visual contact, good oral communication, (no language barriers, noise issues, etc.) when performing work.

12. Inclement weather does not increase hazards.

13. All exposed employees have adequate training: (FPP105 or competent



person training FPP110).

Working on “Rolling Stock” (working from flatbed trucks, trailers, or other similar surfaces).

- MOW shall utilize Fall Prevention/Protection methods when working on “[Rolling Stock](#)” (flatbed trucks, trailers, or other similar surfaces) (Requirements 1910.132 and OSHA General Duty Clause 5a.1).

Hazards:



- Unprotected open-sided areas created by working near edges of flatbed trucks, trailers or similar surfaces.
- Safe access to these work surfaces.
- Refer to [Attachment 4G-3](#), “Rolling Stock.”

*USING FALL-PROTECTION EQUIPMENT

Requirements

Managers shall ensure that:



- MOW are adequately trained and appropriate fall-protection equipment is provided.
- Fall-protection equipment is inspected in accordance with the manufacturer’s recommendations or as a minimum, inspected annually and documented by a competent person ([Word file](#)/[Acrobat file](#)).

Note: For purposes of this application, a “competent person” is defined as one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them (see training [FPP110](#)).

MOW shall:



- Not perform work if exposed to a fall hazard.
- Follow the appropriate TWD for the work activity being performed.
- Read and understand the instructions and warnings on fall-protection equipment prior to use.
- Inspect each piece of fall-protection equipment before and after use according to the manufacturer's recommendations. Refer to SF 2001-FPE, Fall Protection Equipment Checklist ([Word file](#)/ [Acrobat file](#)) for guidance on inspections. The inspection shall include, but not be limited to, the following:
 - The FBH, body belt, and lanyard are stamped with the date of manufacture, manufacturer's name, and the ANSI standard number.
 - D-rings, tongue or billet, and buckle attachments on harnesses and body belts for signs of wear such as the equipment being misshapen, showing signs of exposure to chemicals, or overexposure to sunlight.
 - Equipment webbing for frayed or broken strands.
 - Tongue and friction buckles for distortion.
 - Lanyards for cuts, frayed areas, or unusual wearing patterns.
 - Lanyard hardware, including snaps and thimbles, for distortion or signs of wear.
- Ensure that any parts of the personal fall-protection system that look worn, misshapen, or that show signs of exposure to chemicals or overexposure to sunlight are destroyed.




- Use compatible components of a fall-arrest system.
- Ensure that when anchoring fall protection equipment, select an appropriate point at or above the height of the back D-ring.

Use only anchorages and anchorage connectors that are capable of supporting at

least 5,000 lbs. per person attached or if there is doubt about the integrity or weight-supporting capability of a selected anchor.

Note: For alternative anchorages, consult the [fall-prevention and protection contact](#) for assistance .



Wear the appropriate personal fall-protection equipment such as a full-body harness (FBH) with shock-absorbing lanyard (rather than a body belt, which is not used for fall arrest) as outlined in the TWD (Refer to attachment 4G-1, "Fall Protection Equipment, Components & Fall Clearance Calculations.").

Note: A body belt may be used in combination with a FBH in positioning work only. Check the manufacturer's recommendations for details. Refer to [Attachment 4G-1](#), "Fall Protection Equipment, Components & Fall Clearance Calculations," for a diagram of a fall-protection system, components, and subsystems.

- Consult the fall-prevention and protection contact for assistance and questions on the proper use of fall-protection equipment.
- Not reuse fall-arrest systems that were subjected to a fall.
- Not destroy or discard fall-arrest systems until an investigation is complete.



*MAINTAINING AND STORING PERSONAL FALL-ARREST SYSTEMS

Requirements

MOW who use personal [fall-arrest systems](#) shall:

- Follow manufacturers' instructions regarding maintenance and storage of equipment.
- Ensure that systems stay intact by buying, storing, and using them as a unit.





- Replace a discarded part of a personal fall-arrest system with an identical part or a part that has been identified by the manufacturer as an acceptable replacement part.
- Take the following steps to remove loose debris and soil from personal fall-arrest system components:
 1. Do not use solvents to clean nylon or other synthetic materials. Solvents can compromise the strength of the material.
 2. Use soapy water to clean components, paying particular attention when scrubbing areas with labels to make sure labels remain legible.
 3. Rinse with clear water.
 4. Allow parts to dry in a cool, dry place out of direct sunlight.



Guidance

MOW should store fall-protection equipment in a cool dry place out of direct sunlight because many of the parts of a personal [fall-arrest system](#) are made of nylon or other synthetic material, which is vulnerable to sunlight and chemical damage.

Service Life of the FP Equipment:

- Follow manufactures guidelines related to “Service Life of the Product” (i.e. Shelf Life).
- Fall protection equipment if kept in good condition, properly maintained, and inspected can last for years. As long as equipment is in good condition and SNL is following manufacturer's guidelines the fall protection equipment does not have to be destroyed because it lasts longer than the manufacturer's end of service date. Service life of fall protection products is totally dependent on the condition of the item and not the age. (Refer to [Attachment 4G- 4](#), "Service Life for Personal Fall Arrest Systems").



RELATED HAZARDS AND ACTIVITIES

Other hazards and activities that may be present when performing [elevated work](#) include:

Hazard/Activity	Reference
Working alone	Section 4A , "Working in High-Injury-Potential/Remote Operations," for information about the buddy system.
Ladders and scaffolds	Section 4F , "Ladders, Scaffolds, and Elevating Work Platforms"
Lifting personnel	Section 4J , "Material Handling - Cranes, Hoists, and Forklifts"
Medical services	Chapter 16 , "Health, Benefits, and Employee Services"

*REFERENCES

Requirements Source Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards, Subpart D, "Walking-Working Surfaces."*

29 CFR 1910.66, [Appendix C](#), *Personal Fall-Arrest System.*

[29 CFR 1926](#), *Safety and Health Regulations for Construction, Subpart M, "Fall Protection."*

Related Documents

[ANSI Z359.1-1992 \(R1999\)](#), *Safety Requirements for Personal Fall-Arrest Systems, Subsystems And Components.*

[ANSI/ASSE A10.32-2004](#), *Fall Protection Systems-American National Standard for*

Construction and Demolition Operations.

[DOE-STD-1090-99](#), "Hoisting and Rigging."

Ellis, J. Nigel, and H. Lewis, American Society of Safety Engineers, *Introduction to Fall Protection*, 2001.

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SECTION 2E – FEEDBACK AND IMPROVE

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*Indicates a substantive change

- [Safety Management Function](#)
- [References](#)

SAFETY MANAGEMENT FUNCTION

Guidance

Managers should be aware that "feedback and improve":

- Is the fifth safety management function of Sandia's Integrated Safety Management System (ISMS) (see [CPR 400.1.2](#), *Integrated Safety Management System [ISMS] Description*).
- Comprises those processes, programs, and activities related to:
 - Collecting feedback from Members of the Workforce and customers (e.g., see [Section 18A](#), "Reporting ES&H Concerns and Suggestions for Improvement").

- Managing by walking around.
- Conducting self assessments.
- Using and disseminating [lessons learned](#).
- Completing corrective actions resulting from external audits (i.e., from outside the organization).



Managers should see [CPR001.3.4](#), *The Corporate Work Process (CWP)*, for additional information.

Managers should evaluate the need for ES&H self-assessment activities during the work planning process (see [Section 2A](#), "Plan Work," for more information) and, based on results, may need to:

- Set feedback and improvement performance objectives.
- Institute methods for measuring progress toward objectives.

Managers should see the sections in [Chapter 22](#), "Feedback and Improvement Processes," for information on requirements and guidance related to feedback and improvement:



- [Section 22A](#), "ES&H Self-Assessment Activities."
- [Section 22B](#), "Root Cause Analysis (RCA)."
- [Section 22C](#), "Lessons Learned."

REFERENCES

Requirements Source Documents

SNL, [DE-AC04-94AL85000](#), *M&O Contract Between Sandia Corporation and DOE*.



Implementing Documents

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

Related Documents

SNL, [CPR001.3.4](#), *The Corporate Work Process (CWP)*.



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Corporate Process Requirement No: CPR400.1.1
Sponsor: Dori Ellis, 4000, Acting

Revision Date: April 13,
2007

IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia National Laboratories Internal Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 22 – FEEDBACK AND IMPROVEMENT PROCESSES

MN471001, Issue L

Revision Date: [June 29, 2007](#); Replaces Document Dated: April 13, 2007

- [Section 22A](#) - ES&H Line Self-Assessment (SA) Activities
 - [Section 22B](#) - Root Cause Analysis (RCA)
 - [*Section 22C](#) - Lessons Learned (Last Issue of *ES&H Manual*, Section 22C, Issue C is replaced by ESH100.5.3)
 - [Section 22D](#) - Corrective Action Development, Verification of Completion, and Validation of Effectiveness
 - [Section 22E](#) - Environment, Safety, and Health and Emergency Management Corrective Action Management Program (CAMP)
-

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SECTION 2B – ANALYZE HAZARDS

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* Indicates a substantive change.

- [Safety Management Function](#)
- [Hazard Identification](#)
- [Hazards Analysis](#)
- [References](#)

SAFETY MANAGEMENT FUNCTION

Guidance

Managers should be aware that "analyze hazards":

- Is the second safety management function of Sandia's Integrated Safety Management System (ISMS) (see [CPR 400.1.2](#), *Integrated Safety Management System [ISMS] Description*).
- Comprises those processes, programs, and activities related to:
 - Identifying hazards.

- Categorizing hazards.
- Classifying facilities, activities, and projects by hazards.
- Developing the Authorization Basis for facilities, activities, and projects.

Managers should see [CPR001.3.4](#), *The Corporate Work Process (CWP)*, for additional information.

HAZARD IDENTIFICATION

Requirements

Managers shall ensure that the requirements stated in [Section 13A](#), "Hazards Identification and Classification Process," are met.

HAZARDS ANALYSIS

Requirements

Managers shall ensure that the requirements stated in [Section 13B](#), "Hazards Analysis Process," are met.

REFERENCES

Requirements Source Documents

SNL, [DE-AC04-94AL85000](#), *M&O Contract Between Sandia Corporation and DOE*.

Implementing Documents



[CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

Related Documents

SNL, [CPR001.3.4](#), *The Corporate Work Process (CWP)*.



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ES&H Manual

***SECTION 13B – HAZARDS ANALYSIS PROCESS**

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* Indicates a substantive change

- [Applicability](#)
 - [Training](#)
 - [*Hazards Analysis \(HA\)](#)
 - [Hazards Scenarios](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to:

- Work performed by all Members of the Workforce and work performed in SNL-controlled [operations](#). Included are operations conducted jointly with other organizations, industry, or government agencies at [Sandia-controlled premises](#).
- Hazards identification for operations **not** controlled by SNL if Members of the Workforce are required to work in those operations.

This section does **not** apply to contracts for products or services or vendor-owned equipment in which Members of the Workforce are not directly engaged in the contracted work activity.

TRAINING

Requirements

Work Activity or Role	Required	Recommended
Using the Integrated Safety Management System (ISMS) Software :		
<ul style="list-style-type: none"> • ES&H Coordinators 	ISMS100	N/A
<ul style="list-style-type: none"> • PHS/HA authors 	N/A	ISMS100
<ul style="list-style-type: none"> • Approving managers 	N/A	ISMS100

*HAZARDS ANALYSIS (HA)

Note: The purpose of a hazards analysis is to analyze the causes and consequences of the hazards identified in the PHS, identify available hazard controls, and evaluate the adequacy of these controls. The information gathered by the [HA process](#) will be accessible for other ES&H processes/stakeholders (e.g., for TWDs and by Division ES&H Coordinators) to maximize efficiency.

Requirements

Managers of [operations](#) that are classified as low-hazard nonnuclear or higher shall:

- Ensure HAs are completed using the [Integrated Safety Management System \(ISMS\) Software](#).
- Ensure personnel who author HAs are familiar with the potential hazards of the operations, as indicated by the [Primary Hazard Screening \(PHS\)](#) module output from the ISMS Software.
- Be knowledgeable of the hazards and operations covered by the analyses (e.g., via work process knowledge, briefings, walkdowns, etc.).
- Encourage Members of the Workforce whom they direct and their [Division ES&H Team](#) to become involved in the preparation of HAs.
- Ensure that Members of the Workforce whom they direct are familiar with the content of any HAs related to their work activities and workplaces.
- Ensure HAs are updated when associated [PHSs](#) are [updated](#).

Note: The complete HA number must be the same as the corresponding PHS number.

Members of the Workforce who author or update HAs shall:

- Be knowledgeable of the hazards and operations covered by the analyses.
- Consult with ES&H coordinators, [Division ES&H Teams](#), subject matter experts (SMEs), and personnel performing operations covered by the PHSs, as appropriate.

- List the personnel participating in the analyses.
- Electronically submit HA documents (i.e., as author).

Note: Starting with Version B of the PHS, all documents will be electronically signed by the author, ES&H coordinator, manager, and Risk Management using the "Submit," "Reviewed," or "Approved," button, as appropriate. The record copy of the HA is the electronic version in the database.

- Notify the appropriate ES&H coordinator for technical review and electronic signature.
- Obtain electronic signatures from approving managers on final HA documents.
- Notify the [ISMS Software/Risk Management contact](#) for quality review and electronic signature. The quality review will follow the process outlined in [Appendix 13A-3, "PHS/HA Reviewer Tool."](#)

Note: With the implementation of electronic signatures (see the preceding note), the record copy of the HA is the electronic version in the database. Minor administrative changes (e.g., typos) may be made by the author without re-review and approval of the HA. However, any changes to the nature of the operation that would involve altering any of the controls identified in the HA does require re-review and approval.

ES&H coordinators shall:

- Assist Members of the Workforce in completing HAs upon request.
- Review HAs for technical accuracy.

Note: Technical reviews ensure that HAs are technically correct and that all hazards are adequately mitigated. These reviews may include walk-downs by ES&H coordinators. A tool to assist in reviewing PHS/HA documents is located at [Attachment 13A-3, "PHS/HA Reviewer Tool."](#)

- Electronically sign HAs.
- Brief approving managers, if necessary, before the managers electronically sign

HAs.

Managers shall:

- **Electronically** sign HAs to indicate their approval and that the HAs are complete and accurate.
- Obtain approval for implementation deviations involving contract requirements by submitting exemption requests, equivalency requests, or phased implementation requests in accordance with [CPR400.1.2.2](#), *Process for Flow-down and Tailoring of Requirements and Standards that Support Sandia's Integrated Safety Management System*.

Managers of moderate-hazard nonnuclear, accelerator, or nuclear operations, shall be responsible for ensuring that HAs for those operations analyze low hazards identified by the PHSs but **not** explicitly analyzed in more rigorous documents (e.g., Safety Analysis Reports [SARs], Safety Assessment Documents [SADs]).

Guidance

Note: Managers new to an organization should read all HA documents associated with their operations.

Managers should:

- Be aware that a component of analyzing hazards is the identification of potential consequence scenarios and an evaluation of their probabilities and the costs and safety benefits associated with mitigation.
- Consult with their [Division ES&H Team](#) for risk management support.
- Consult the ES&H Teams and Risk Management Department (3111) for risk management decisions involving hazards classifications above low-hazard nonnuclear.

[Hazards Analysis \(HA\)](#) authors can analyze for reasonable consequences when performing an HA. In most cases [unmitigated consequences](#) are considered; however, if redundant (or multiple) safety systems are in place, the author may consider that



consequence(s) are reasonably [mitigated](#).

Members of the Workforce should do the following if they need assistance with the HA module of the ISMS Software:

- Call the [Corporate Computing Help Desk \(CCHD\)](#) if there are problems starting the program.
- Contact the [ISMS Software Helpline](#) for all other problems.
- Attend the [ISMS 100](#) Software training course,

HAZARDS SCENARIOS



Guidance

Note: Common hazards scenarios have been developed for all hazard sources identified by [Primary Hazard Screenings \(PHSs\)](#). These scenarios were developed and approved by subject matter experts (SMEs). The purpose is to provide [Hazards Analysis \(HA\)](#) authors with typical causes (i.e., initiating events), consequences, and controls for all hazard sources and conditions imported to HAs from the corresponding [PHSs](#). This will assist HA authors in determining if sufficient analyses have been done. An 'Add-Scenario' button will appear on the HA analysis screen if a scenario is available for the particular hazard being analyzed.

Members of the Workforce should use:

- HA scenarios when preparing their HAs.
- Only the parts of the scenarios that are applicable to their operation (e.g., if a scenario lists a control that does **not** exist within the operation, then the control should be deleted from the analysis).

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to hazards analysis include:

Hazard/Activity	Reference
Authorization Basis	Section 13C , "Authorization Basis Process"
Hazards management	Section 13A , "Hazards Identification and Classification Process"
National Environmental Policy Act (NEPA)	Section 10B , "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties"
Readiness Review	Section 13D , "Readiness Review Process"
Safety analyses for moderate- and high-hazard operations	Section 13C , "Authorization Basis Process"
Hazard Assessment Documents (HAD)	PN471011 , <i>SNL/NM Emergency Plan</i>

REFERENCES

Requirements Source Documents

[DOE O 420.1](#), *Facility Safety*.

[DOE O 425.1A](#), *Startup and Restart of Nuclear Facilities*.

[DOE/AL 425.1A](#), *Startup and Restart of AL Activities*.

Implementing Documents

SNL, [AOP 98-05](#), *Primary Hazard Screening (PHS) Question Sets (Version 21)*.

SNL, [AOP 98-06](#), *Integrated Safety Management System (ISMS) Software PHS Question Set 19 and 20*.

SNL, [AOP 99-07](#), *Integrated Safety Management System (ISMS) Software Process Definition - PHS Question Set Version A.*

SNL, [AOP 99-08](#), *Environmental, Safety and Health (ES&H) Requirements Notification and Tracking.*

SNL, [AOP 00-08](#), *Primary Hazard Screening (PHS) Question Sets (Version A1).*

SNL, AOP 00-12, *Primary Hazard Screening (PHS) Question Sets (Version B).*

SNL, [PN471011](#), *SNL/NM Emergency Plan.*

Laskar, George, *KAO Response to SNL Hazard Classification Criteria*, memo to R. Silver, SNL/NM, January 6, 1998.

Laskar, George, *Procedure Change: DOE/KAO Approval of Primary Hazard Screens (PHS)*, memo to F. Galegar, SNL/NM, December 8, 1998.

Rohde, Richard W., *Request for Delegation of Startup and Restart Authority for Low Hazard, Non-Nuclear Operations*, memo to G. Laskar, Assistant Area Manager U.S. DOE, Kirtland Area Office, April 22, 1999.

Zamorski, Michael J., *Delegation of Startup and Restart of Authority for Low-Hazard, Non-Nuclear Operations*, memo to Lynn Jones, SNL/NM, May 6, 1999.

Related Documents

DOE G 450-4, *Integrated Safety Management System.*



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ES&H Manual

*SECTION 13C – AUTHORIZATION BASIS PROCESS

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* Indicates a substantive change

- [*Applicability](#)
- [*Authorization Basis Process](#)
- [*All Sandia Activities](#)
- [*Business Occupancy Assurance Process](#)
- [*Standard Industrial Hazard \(SIH\) Assurance Process](#)
- [*Low-Hazard Nonnuclear Assurance Process](#)
- [*Moderate-and High-Hazard Nonnuclear Activities Assurance process](#)
- [*Accelerator Activities Assurance Process](#)
- [*Nuclear Activities Assurance Process](#)
- [*Records](#)
- [*Related Hazards and Activities](#)
- [*References](#)
- Attachments
 - [*13C-1](#) – Required Documentation and Authorization Authority by Hazard Classification
 - [*13C-2](#) – Independent Reviewer Qualifications



- [*13C-3](#) – Guidance for Stand-Alone Hazards Analyses
 - [*13C-4](#) – Recommended Review Criteria for Stand-Alone Hazards Analyses (HAs)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to:

- All nuclear facilities below hazard category 3. These are facilities that contain radiological hazards to be controlled as prescribed by CPR400.1.1.32/MN471016, *Radiation Protection Procedures Manual*, as well as through the authorization basis process.
- Work performed by all Members of the Workforce and work performed in **SNL-controlled activities**, including activities conducted jointly with other organizations, industry, or government agencies on [Sandia-controlled premises](#).
- Hazards identification for operations **not** controlled by SNL if Members of the Workforce are required to work in those activities.

This section does **not** apply to contracts for products, services, or vendor-owned equipment in which Members of the Workforce are not directly engaged in the contracted work activity.

*AUTHORIZATION BASIS PROCESS

Guidance

The [Authorization Basis](#) Process defines the [safety envelope](#) for each facility or activity.

The Authorization Basis Process encompasses hazards identification and classification processes begun in [Section 13A](#), "Hazards Identification and Classification Process," and [Section 13B](#), "Hazards Analysis Process." The safety envelope also encompasses the application of any controls that may be required for any other process controlled by the [CPR400.1.1/MN471001](#), *ES&H Manual*, such as:

- Work planning in accordance with CPR400.1.1/MN471001, *ES&H Manual*, [Section 2A](#), "Plan Work."
- Packaging and transportation of hazardous material in accordance with CPR400.1.1/MN471001, *ES&H Manual*, [Chapter 12](#), "Packaging and Transportation of Hazardous Material."
- Identification and evaluation of radiological hazards specified in [CPR400.1.1.32/MN471016](#), *Radiological Protection Procedures Manual*.

Note: The Authorization Basis Process demonstrates compliance with applicable federal, state, and local laws, regulations, and requirements as implemented through CPR400.1.1/MN471001, *ES&H Manual*.

*ALL SANDIA ACTIVITIES

Requirements

Managers, prior to the initial startup or restart of any activity, shall be responsible for ensuring that:

- Members of the Workforce are qualified by appropriate education, knowledge, and experience to complete and review safety documentation as required for an activity.
- The [Authorization Basis](#) Process is authorized. See [Attachment 13C-1](#), "Required Documentation and Authorization Authority by Hazard Classification," for Sandia and DOE authorization levels required for each hazard classification.


- Members of the Workforce are instructed about the safety documentation that constitutes the Authorization Basis Process for their work location and assigned activities, and of changes in the safety documentation as they occur.
- The need for changes to safety documentation listed in [Attachment 13C-1](#) is evaluated no less than once annually in accordance with the requirements of [Section 13A](#), "Hazards Identification and Classification Process." Newly identified hazards and changes to existing hazards are documented in the PHS and implemented in other appropriate safety documentation.
- Changes to previously approved safety documentation are approved and communicated to Members of the Workforce in the same manner as described above for the original safety documentation, unless there is a change in hazard classification.
- Radioactive materials are not introduced into a nonnuclear facility prior to an evaluation in the safety documentation per [DOE STD 1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, as instructed by Section 13A, "Preparation, Maintenance, and Review of Primary hazard Screenings (PHSs)," to ensure that threshold material quantities are not exceeded. See [Section 13A](#) for additional information.
- For nonnuclear activities having a radiological hazard, the requirements of [10 CFR 830](#), *Nuclear Safety Management*, and [10 CFR 835](#), *Occupational Radiation Protection*, as appropriate, are implemented through [CPR400.1.1.32/MN471016](#), *Radiological Protection Procedures Manual (RPPM)*.
- Training, permits, and safety-related controls are completed as identified by applicable Authorization Basis Process documentation, emergency planning requirements, and technical work documents (TWDs) per CPR400.1.1/MN471001, *ES&H Manual*, [Chapter 21](#), "Technical Work Documents (TWDs)," and listed in the PHS are complete.
- Processes are in place for:
 - Reporting occurrences. See [Section 18C](#), "Occurrence Reporting."
 - Departmental self-assessment of ES&H requirements implementation. See

Chapter 22, “Feedback and Improvement Processes.”

- A readiness review is completed according to Section 13D, “Readiness Review Process.”

Guidance

Members of the Workforce should:

- 
- See CPR400.1.1.32/MN 471016, Radiation Protection Procedures Manual (RPPM) for radiological hazard requirements and implementation of 10 CFR 835, Occupational Radiation Protection.
 - Be aware that radioactive materials or processes may pose potential Price Anderson Amendment Act (PAAA) liabilities. See the RPPM and consult the radiation protection contact on the appropriate Division ES&H Team and the PAAA Office for further guidance.
 - Consult the industrial hygiene contact on the appropriate Division ES&H Team for issues related to chemical hazards, such as the toxic and reactive chemical thresholds specified in Appendix A of 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.




*BUSINESS OCCUPANCY ASSURANCE PROCESS

Note: The Authorization Basis Process for business occupancy (office) consists of the approved Primary Hazard Screening (PHS) for an office operation.

Requirements

Managers shall be responsible for ensuring that:

- PHSs, specified in Attachment 13C-1 and described in Section 13A, “Hazards Identification and Classification Process,” are completed by individuals who are




familiar with the potential hazards and by other technical specialists, as appropriate.

- PHSs are reviewed and approved.

Note: Within a center, managers may use one or more PHSs for all office operations under their control that are classified as business occupancy.

*STANDARD INDUSTRIAL HAZARD (SIH) ASSURANCE PROCESS




Note: The [Authorization Basis](#) Process for an SIH operation consists of the approved [Primary Hazard Screening \(PHS\)](#) for the operation.

Requirements

Managers of SIH operations shall be responsible for ensuring that safety documentation is completed and authorized per [Attachment 13C-1](#), "Required Documentation and Authorization Authority by Hazard Classification," by appropriately qualified persons (i.e., those having relevant education, training, and experience).

*LOW-HAZARD NONNUCLEAR ASSURANCE PROCESS



Note: The [Authorization Basis](#) Process for a [low-hazard nonnuclear operation](#) consists of an approved [Primary Hazard Screening \(PHS\)](#) and Hazards Analysis (HA).

Requirements

Managers of low-hazard nonnuclear operations shall be responsible for ensuring that safety documentation is completed and approved according to [Attachment 13C-1](#), "Required Documentation and Authorization Authority by Hazard Classification," by

appropriately qualified persons (i.e., those having relevant education, training, and experience).

Guidance

When low hazards are to be assessed in a document other than the HA generated by the ISMS software, the ISMS software HA may merely refer to that document.

Managers may elect to produce a more rigorous stand-alone HA than is currently accommodated by the ISMS software HA. See [Attachment 13C-3](#), "Guidance for Stand-Alone Hazards Analysis," and [Attachment 13C-4](#), "Recommended Review Criteria for Stand-Alone Hazards Analysis."

*MODERATE-AND HIGH-HAZARD NONNUCLEAR ACTIVITIES ASSURANCE PROCESS

Note: [Authorization Basis Process for moderate- and high-hazard nonnuclear operations](#) consists of the approved [Primary Hazard Screening \(PHS\)](#), Hazards Analysis (HA), and [Safety Assessment \(SA\)](#) for the operation.

Note: SNL currently has no operation classified as high-hazard.

Requirements

Managers of moderate- and high-hazard nonnuclear operations are responsible for ensuring that:

- The Safety Assessment (SA) specified in [Attachment 13C-1](#), "Required Documentation and Authorization Authority by Hazard Classification," and described in [R.S.V.P./GN470088](#), *Preparation and Review of Safety Assessment for Moderate- and High-Hazard Nonnuclear Facilities*, is prepared and approved by appropriately qualified persons (i.e., those having relevant education, training, and experience).
- Members of the Workforce who prepare and review the SA for moderate-and high-

hazard activities are cognizant of the required scope of the SA and review criteria contained in [GN470088](#) to ensure a systematic process.

- An independent review team meeting the requirements of [Attachment 13C-2](#), "Independent Reviewer Qualifications," is assigned, with the concurrence of the [Risk Management/Physical Security/MC&A/NMM Department](#), to evaluate the SA and issue a review report.
- The final version of the SA is approved by appropriate management in accordance with Attachment 13 C-1 and a copy is sent to the Risk Management/Physical Security/MC&A/NMM Department.
- A written statement is provided to the Risk Management/Physical Security/MC&A/NMM Department stating acceptance of findings, corrective actions and recommendations, or briefly explaining why any of these may not have been accepted.
- In the event of disagreements about findings between preparers of the SA and the review team, rapid resolution is accomplished by line and Risk Management/Physical Security/MC&A/NMM Department agreement, and if necessary, by director or vice president level discussion.

Note: The scope of the SA is normally limited to an assessment of the specific hazards that resulted in the moderate- or high-hazard nonnuclear classification. However, the manager may elect to integrate the assessment of low and standard industrial hazards with the moderate and high hazards in the SA. When low hazards are to be assessed in the SA, the ISMS software HA may merely refer to that document.

Independent reviewers shall:

- Become familiar with the activity, its history, safety documentation and procedures.
- Apply the minimum review criteria of [GN470088](#), "Preparation and Review of Safety Assessments for Moderate- and High-hazard Nonnuclear Facilities," and other appropriate criteria such as those contained in regulatory requirements.
- Report the review results to the manager of the facility or operation.
- Include in their report:



- An introduction and appropriate background discussion that provides the administrative record of the review process.
- Table of the minimum review criteria found at GN470088, [Section 5](#), “Minimum Review Criteria,”.
- For each criterion met, citation of the evidence and, if warranted, [recommendations](#) for enhancing safety beyond minimum requirements.
- For each criterion not met, appropriate explanatory text and a statement of [finding](#), together with an indicated [corrective action](#).
- Signatures of all reviewers.

Guidance



Members of the Workforce should consult the [risk management contact](#) if they believe that any operation may be a high-hazard nonnuclear operation.

*ACCELERATOR ACTIVITIES ASSURANCE PROCESS

Note: The DOE Assurance Basis for higher energy accelerator facilities consists of the approved [Primary Hazard Screening \(PHS\)](#), Hazards Analysis (HA), and [Safety Assessment Document \(SAD\)](#) for the operation. This section implements [DOE O 420.2A](#), *Safety of Accelerator Facilities*.

Requirements



Managers of [accelerator](#) facilities shall:

- Assign personnel who are familiar with the potential hazards in their facilities to complete safety documentation as specified in [Attachment 13C-1](#).

- For the SAD, meet the requirements of [DOE O 420.2A](#), but use the same format and criteria as required for moderate- and high-hazard nonnuclear facilities specified in this section.
- Ensure that all safety documentation is completed and approved as required.
- Use the independent review process, as required, for moderate- and high-hazard nonnuclear facilities as specified in this section.



*NUCLEAR ACTIVITIES ASSURANCE PROCESS

Note: The [Authorization Basis](#) Process for a nuclear activity encompasses the [Primary Hazard Screening \(PHS\)](#), Hazards Analysis (HA), and DOE's Documented Safety Analysis (DSA) per 10 CFR 830 Part B. The DSA includes the approved Safety Analysis Reports (SARs), [technical safety requirements \(TSRs\)](#), and [unreviewed safety question determinations \(USQDs\)](#), as well as [authorization agreements \(AAs\)](#) and applicable procedures and experiment plans.

Requirements

Managers of nuclear facilities shall be responsible for ensuring that:

- All required safety documentation per Attachment 13C-1, "Required Documentation and Authorization Authority by Hazard Classification," as well as other applicable regulator requirements in the Prime Contract, [Appendix J](#), are completed and approved in accordance with:
 - [CPR400.1.1.20/GN470080](#), *Implementing the Unreviewed Safety Question (USQ) Process for Nuclear Facilities.*
 - [CPR400.1.1.38/GN470101](#), *Preparation and Review of Documented Safety Analyses (DSAs) to Meet 10 CFR 830, Subpart B.*
 - [CPR400.1.1.39/GN470102](#), *Preparation and Review of Technical Safety Requirements (TSRs) to Meet 10 CFR 830, Subpart B.*



- Members of the Workforce assigned to the process are familiar enough with the potential hazards in their facilities to complete the safety documentation specified above.

Note: Department-specific processes may provide additional requirements and guidance for the preparation, review, and approval of the DSA.

*RECORDS

Requirements

Managers shall be responsible for ensuring that line organizations maintain records in accordance with the Sandia Records Retention and Disposition Schedule, [SA-140-202-000](#), "Safety Assessments (SA) Records." p>

*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to safety analyses for [moderate-](#) and [high-hazard facilities](#) include:

Hazard/Activity	ES&H Manual Reference
Air quality compliance	Chapter 17 , "Air Emissions"
Chemical hazards	Chapter 6 , "Industrial Hygiene"
Emergency management	Chapter 15 , "Emergency Preparedness and Management"
Environmental compliance	Chapter 10 , "Environmental Protection"
Explosion hazards	Chapter 9 , "Explosives Safety"
Feedback and improvement	Chapter 22 , "Feedback and Improvement Process"

Fire hazards	Chapter 5, "Fire Protection"
Hazardous material management	Chapter 12, "Packaging and Transportation of Hazardous Material"
Hazards analysis	Section 13B, "Hazards Analysis Process"
Hazards identification	Section 13A, "Hazards Identification and Classification Process"
Incident reporting	Chapter 18, "Reporting, Investigating, and Correcting ES&H Events"
Office hazards	Chapter 3, "Office Safety"
Operational modes	Chapter 7, "Accountability and Operational Modes for Facilities"
Procedures to manage hazards	Chapter 21, "Technical Work Documents (TWDs)"
Radiation hazards	Chapter 8, "Occupational Radiation Protection"
Readiness review	Section 13D, "Readiness Review Process"
Standard industrial hazards	Chapter 4, "Industrial Safety"
Waste management	Chapter 19, "Waste Management"

*REFERENCES

Requirements Basis Documents for all Sandia Activities

[DOE O 151.1](#), *Comprehensive Emergency Management System*.

[DOE O 420.1A](#), *Facility Safety*.

Requirements Basis Documents for Nuclear and Accelerator Activities

[10 CFR 830](#), *Nuclear Safety Management*.

[10 CFR 835](#), *Occupational Radiation Protection*.

[DOE-STD-3009-94](#), *Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports*.

[DOE-STD-1027-92](#), *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*.

[DOE O 420.2A](#), *Safety of Accelerator Facilities*.

Implementing Documents

SNL, [CPR400.1.2](#), *SNLs' Integrated Safety Management System (ISMS)*.

SNL, CPR400.1.1.14/[GN470080](#), *Implementing the Unreviewed Safety Question (USQ) Process for Nuclear Facilities*.

SNL, CPR400.1.1.20/[GN470088](#), *Preparation and Review of Safety Assessments for Moderate- and High-hazard Nonnuclear Facilities*.

SNL, CPR400.1.1.21/[GN470089](#), *Startup and Restart Process for SNL Moderate- and High-Hazard Nonnuclear, Accelerator, and Nuclear Activities*.

SNL, CPR400.1.1.38/[GN470101](#), *Preparation and Review of Documented Safety Analyses (DSAs) to Meet 10 CFR 830, Subpart B*.

SNL, CPR400.1.1.39/[GN470102](#), *Preparation and Review of Technical Safety Requirements (TSRs) to Meet 10 CFR 830, Subpart B*.

*Related Documents

Center for Chemical Process Safety, *Guidelines For Hazard Evaluation Procedures, 2nd Ed*, American Institute of Chemical Engineers (AIChE), New York, 1992.

[29 CFR 1910.119](#), *Process Safety Management of Highly Hazardous Chemicals*.

[42 USC 2010](#), *et seq.*, *Price-Anderson Amendments Act of 1988*.

[DOE O 413.3](#), *Program & Project Management for the Acquisition of Capital Assets*.

[DOE O 425.1B](#), *Startup and Restart of AL Facilities/Activities*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

DOE, SEN-35-91, *Nuclear Safety Policy*.

Laskar, George, *Procedure Change: DOE/KAO Approval of Primary Hazard Screens (PHS)*, memo to F. Galegar, SNL/NM, December 8, 1998.

Zamorski, Michael, DOE/SSO: *Implementation of DOE 420.1 and DOE-STD-1027 Requirements*, memo to L.A. West, May 14, 2002.



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ES&H Manual

SECTION 13D – READINESS REVIEW PROCESS – PLANNING, REVIEW, AND APPROVAL

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- [Applicability](#)
- [Sandia Readiness Review Process](#)
- [All Sandia Activities](#)
- [Business Occupancy Readiness Review Process](#)
- [Standard Industrial Hazard Readiness Review Process](#)
- [Low-Hazard Nonnuclear Readiness Review Process](#)
- [Moderate - and High-Hazard Nonnuclear Activities Readiness Review Process](#)
- [Accelerator Activities Readiness Review Process](#)
- [Nuclear Readiness Review Process](#)
- [Records](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - [13D-1](#) - Required Readiness Review Documentation by Hazard Classification
 - [13D-2](#) - Guidelines for Planning Standard Industrial Hazard and Low-Hazard Reviews

- [13D-3](#) - Startup/Restart Review for Standard Industrial Hazard and Low-Hazard Non-nuclear Operations
 - [13D-4](#) - Checklists
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to the startup or restart of Sandia-controlled activities, including activities conducted jointly with other organizations, industry, or government agencies on [Sandia-controlled premises](#).

This section does **not** apply to contracts for products or services or vendor-owned equipment in which Members of the Workforce are not directly engaged in the contracted work activity.

The process and activities described in this section are **not** substitutes for periodic management surveillances of ongoing Sandia-controlled facilities and/or activities. See [CPR400.1.1.4/GN470034](#), *Performing and Documenting Management Surveillances*, for additional information on those types of activities.

SANDIA READINESS REVIEW PROCESS

Guidance

The purpose of the [Readiness Review](#) (RR) process is to ensure the readiness of the facility and personnel to start or restart operations within the bounds of acceptable risk as described in the facility's or activity's authorization basis and in compliance with applicable ES&H requirements. This process is the verification or validation step that

occurs after the completion of the authorization basis process (see [Section 13C](#), “Authorization Basis Process”), but prior to the start or restart of operations.

Sandia RRs apply the principle of a [graded approach](#), which is the process by which the readiness review is adjusted in scope and depth of detail required and magnitude of resources expended to be commensurate with the facility's potential impact on safety, environmental compliance, safeguards and security, and its programmatic importance, including present and future mission. This is accomplished by grading the breadth and depth of scope of the RR primarily according to the Hazard Classification of the facility/activity.

Note: When a RR is not required, but approved safety basis changes need to be evaluated prior to implementation, managers of facilities and activities can use the Implementation Validation Review (IVR) process (see, PLA 05-20, Implementation Validation Review (IVR) process Plan for Nuclear Safety Basis Changes). The IVR process is a tool to validate readiness to operate after having implemented a new or revised PHS, safety assessment document, or safety basis documents, and can also be used in preparation for a planned RR. It is important to note, however, that the IVR process is **not** intended to be a substitute for startup or restart activities determined to be subject to a RR.

ALL SANDIA ACTIVITIES

Requirements

Note 1: Sandia startup and restart processes use a [graded approach](#) based on the hazard classification of the facility or activity subject to a readiness review. Thus, implementation of the requirements cited below vary according to the hazard classification as shown on [Attachment 13D-1](#), Required Readiness Review Documentation by Hazard Classification, and as otherwise specified in the subsections that follow.

Note 2: Updating a [PHS](#) does not trigger the requirements of this section unless the reason for updating the PHS involved a shutdown followed by a restart.

Prior to the initial [startup](#) or subsequent [restart](#) of any facility or activity, the manager of

that facility or activity shall ensure that:

- The minimum reviewer requirements for the RR are assigned in accordance with Attachment 13D-1, Required Readiness Review Documentation by Hazard Classification.

- The items that make up the [safety basis](#) for the facility or activity have been:
 - Approved prior to the initiation of the RR.
 - Made available to the readiness reviewers during the RR.

Note: See [Attachment 13C-1](#), Required Documentation and Authorization Authority by Hazard Classification, for additional information on required items for each hazard classification.

- A readiness review plan is prepared per guidance found in the subsections that follow (listed by hazard classification).

- The RR is conducted in accordance with the readiness review plan.
- A report of the results of the RR is prepared at the conclusion of the review.
- Startup or restart of the facility or activity occurs only upon closure and verification of closure of all pre-start findings cited by the readiness review final report.
- Records are maintained as defined in the subsection, "[Records](#)."

BUSINESS OCCUPANCY READINESS REVIEW PROCESS

Requirements

In addition to the requirements outlined in subsection, "[All Sandia Activities](#)," managers of new business occupancy facilities and activities shall be responsible for ensuring that:

- The Business Occupancy Readiness Review Plan consists of a checklist tailored to address the safety controls described in the [PHS](#).

Note: The review plan may include design requirements, additional training requirements, facility agreement requirements for maintenance, etc.

- They approve the Business Occupancy Readiness Review Plan prior to its execution.
- The checklist is completed by interviewing staff, reviewing documents, walking down the facility, and verifying that each item is satisfied (see [Attachment 13D-1](#), Required Readiness Review Documentation by Hazard Classification, for minimum reviewer requirements).
- The final report of the RR consists of the completed checklist signed by the reviewer(s).
- Deficiencies identified during the readiness review are corrected.
- They approve the final report.

Note: A single Business Occupancy Readiness Review may be prepared for all facilities in a given Sandia Center organization (e.g., Center 3300, Center 10300). In this case, the Business Occupancy Readiness Review would need to be approved by the Center Director.

STANDARD INDUSTRIAL HAZARD READINESS REVIEW PROCESS

Requirements

In addition to the requirements outlined in subsection, "[All Sandia Activities](#)," managers of standard industrial hazard (SIH) facilities or activities shall be responsible for ensuring that:

- The Standard Industrial Hazard Readiness Review (SR) plan, at a minimum:



- Consists of the activities and content established in [Attachment 13D-2](#), Guidelines for Planning Standard Industrial Hazard and Low-Hazard Reviews.
- Includes the checklist in [Attachment 13D-3](#), Startup/Restart Review for Standard Industrial Hazard and Low-Hazard Non-nuclear Operations.
- Identifies and includes applicable safety-related checklists (or development of facility-specific checklists) that verify the safety control measures specified in the PHS.

Note: See the various forms, checklists, and tools listed in [Attachment 13D-4](#), Checklists, for possible application to facility and activity-specific safety issues. These items may be tailored as deemed necessary for the SR.



- They approve the SR plan prior to its execution.
- The checklist(s) is completed by interviewing staff, reviewing documents, walking down the facility, and verifying that each item is satisfied (see [Attachment 13D-1](#), Required Readiness Review Documentation by Hazard Classification, for minimum reviewer requirements).
- Actions are taken to resolve deficiencies.
- The final report of the RR at a minimum consists of the completed checklist(s) and is signed by the reviewer(s).
- They approve the final report prior to the startup or restart.



LOW-HAZARD INDUSTRIAL READINESS REVIEW PROCESS

Requirements

In addition to the requirements outlined in subsection, [“All Sandia Activities,”](#) managers

of low-hazard industrial facilities and activities shall be responsible for ensuring that:

- The Low Hazard [Readiness Review](#) (LR) plan, at a minimum:
 - Consists of the activities and content established in [Attachment 13D-2](#), Guidelines for Planning Standard Industrial Hazard and Low-Hazard Reviews.
 - Includes the checklist in [Attachment 13D-3](#), Startup/Restart Review for Standard Industrial Hazard and Low-Hazard Operations.
 - Identifies and includes applicable safety-related checklists (or development of facility-specific checklists) that verify the control measures specified in the [PHS](#) and the [HA](#).

Note: See the various forms, checklists, and tools listed in [Attachment 13D-4](#), Checklists, for possible application to facility and activity-specific safety issues. These items may be tailored as deemed necessary for the LR.

- They approve the LR plan prior to its execution.
 - The checklist(s) is completed by interviewing staff, reviewing documents, walking down the facility, and verifying that each item is satisfied (see [Attachment 13D-1](#), Required Readiness Review Documentation by Hazard Classification, for minimum reviewer requirements).
 - Actions are taken to resolve deficiencies.
 - The final report of the RR at a minimum consists of the completed checklist(s) and is signed by the reviewer(s).
 - They approve the final report prior to the startup or restart.

MODERATE- AND HIGH-HAZARD INDUSTRIAL READINESS REVIEW PROCESS

Requirements

In addition to the requirements outlined in subsection, "[All Sandia Activities](#)," managers of moderate- and high-hazard industrial facilities and activities shall be responsible for ensuring that:

- RR activities are planned with and conducted through the Sandia [Safety Basis Department](#).
- The processes and methodologies described in [CPR400.1.1.21](#)/GN470089, *Startup and Restart Process for Sandia Nuclear Facilities/Activities*, are implemented using a graded approach to reflect the different types of hazards and needed controls for the facility or activities.

Guidance

Managers should contact the Safety Basis Department early in the planning stages of a startup or restart to ensure that the RR is scheduled to fit the needs of the program or activity and can be adequately supported by the Safety Basis Department.

ACCELERATOR READINESS REVIEW PROCESS

Requirements

In addition to the requirements outlined in subsection, "[All Sandia Activities](#)," managers of [accelerator](#) facilities/activities shall be responsible for ensuring that:

- An [Accelerator Readiness Review](#) (ARR) is conducted.
- RR activities are planned with and conducted through the Sandia [Safety Basis Department](#).
- The processes and methodologies described in [CPR400.1.1.21](#)/GN470089, *Startup and Restart Process for Sandia Nuclear Facilities/Activities* are implemented using a graded approach to reflect the different types of hazards and

needed controls for an accelerator.



Guidance

Managers should contact the Safety Basis Department early in the planning stages of a startup or restart to ensure that the RR is scheduled to fit the needs of the program or activity and can be adequately supported by the Safety Basis Department.

[DOE G 420.2-1](#), *Accelerator Facility Safety Implementation Guide for DOE O 420.2B, Safety of Accelerator Facilities*, outlines the major categories, activities, and outcomes that should be accomplished during an ARR. Managers of accelerator facilities should ensure that DOE G 420.2-1, is used to plan, implement, and execute the ARR.

NUCLEAR READINESS REVIEW PROCESS



Requirements

In addition to the requirements outlined in subsection, "[All Sandia Activities](#)," managers of hazard category 1, 2, or 3 DOE nuclear facilities or activities shall be responsible for ensuring that:

- The process described in [CPR400.1.1.21](#)/GN470089, *Startup and Restart Process for Sandia Nuclear Facilities/ Activities*, is followed.
- A record is made of actions taken to resolve and close out all [findings](#) in accordance with [Chapter 22](#), "Feedback and Improvement Processes."

RECORDS



Requirements

Managers of reviewed facilities/activities shall ensure that the records generated during performance of the reviews are maintained as described in this section in accordance

with the Sandia Records Retention and Disposition Schedule, [SA-140-202-000](#), "Safety Assessments (SA) Records."

Note: Records include completed checklists, readiness review final reports and a record of completion of the readiness review. Additional record requirements for hazard category 1, 2, and 3 DOE nuclear facilities/activities startup and restart processes, are described in [CPR400.1.1.21](#)/GN470089, *Startup and Restart Process for Sandia Nuclear Facilities/Activities*.

RELATED HAZARDS AND ACTIVITIES

Requirements and guidance for hazards associated with Sandia activities include the following:

Hazard/Activity	Reference
Hazards identification	Section 13A , "Hazards Identification and Classification Process."
Hazards analysis	Section 13B , "Hazards Analysis Process."
Authorization Basis	Section 13C , "Authorization Basis Process."
Office hazards	Chapter 3 , "Office Safety."
Procedures to manage hazards	Chapter 21 , "Technical Work Documents (TWDs)."
Radiation hazards	Chapter 8 , "Occupational Radiation Protection", and CPR400.1.1.32 /MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i> .
Standard industrial hazards	Chapter 4 , "Industrial Safety."
Safety Assessments	CPR400.1.1.20 /GN470088, <i>Preparation and Review of Safety Assessments for Moderate- and High-Hazard Non-nuclear Facilities and Accelerator Safety Assessments</i> .

Nuclear Facilities Startup/Restart	CPR400.1.1.20 /GN470089, <i>Startup and Restart Process for Sandia Nuclear Facilities/Activities.</i>
DSAs/TSRs	CPR400.1.1.20 /GN470101, <i>Preparation and Review of Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) to Meet 10 CFR 830, Subpart B.</i>

REFERENCES

Requirements Source Documents

DE-AC04-94AL85000, *Management and Operating Contract Between Sandia Corporation and DOE*, Section I, [Clause 73: DEAR 970.5204-3](#) Access to and Ownership of Records (DEC 2000).

[DOE O 425.1C](#), *Startup and Restart of Nuclear Facilities.*

[DOE O 420.1B](#), *Facility Safety.*

[DOE O 420.2B](#), *Safety of Accelerator Facilities.*

Implementing Documents

SNL, [CPR400.1.1.20](#)/GN470089, *Startup and Restart Process for Sandia Nuclear Facilities/Activities.*

[DOE G 420.2-1](#), *Accelerator Facility Safety Implementation Guide for DOE O 420.2B, Safety of Accelerator Facilities.*

Related Documents

[DOE-STD-3006-2000](#), *Planning and Conduct of Operational Readiness Reviews (ORR).*

[DOE-HDBK-3012-96](#), *Guide to Good Practices for Operational Readiness Reviews (ORR), Team Leader's Guide.*

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description.*

SNL, [CPR400.1.1.20](#)/GN470088, *Preparation and Review of Safety Assessments for Moderate- and High-Hazard Non-nuclear Facilities and Accelerator Safety Assessments.*

SNL, [CPR400.1.1.20](#)/GN470101, *Preparation and Review of Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) to Meet 10 CFR 830, Subpart B.*



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ES&H Manual

* ATTACHMENT 19A-1 – MANAGING HAZARDOUS WASTE AT A LESS-THAN-90-DAY ACCUMULATION AREA

Subject Matter Expert: [Terry Cooper](#); CA Counterpart: [Deanna Dicker](#)

MN471001, Issue M

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 * Indicates a substantive change

- [Applicability](#)
 - [Training](#)
 - [Containers](#)
 - [Markings](#)
 - [Time Limit](#)
 - [Preparedness and Prevention](#)
 - [*Contingency Plan](#)
 - [Emergency Coordinator](#)
 - [Inspections](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This attachment applies to Members of the Workforce who manage material identified as hazardous waste at a less-than-90-day accumulation area on [Sandia-controlled premises](#) within the State of New Mexico. Less-than-90-day accumulation areas should be established when owners or generators:

- Accumulate greater than 55 gallons of hazardous waste or 1 quart of acute hazardous waste for greater than three calendar days.
- Accept waste from other generators or satellite accumulation points (SAPs).

TRAINING

Requirements

Emergency coordinators and Members of the Workforce with responsibilities for operation or inspection of a less-than-90-day-accumulation area shall:

- Successfully complete [ENV216](#) or [ENV216SPEC](#), and RCRA Accumulation Area and Contingency Plan Training, within six months of the date of assignment to the facility.
- Not perform unsupervised work until the required training is successfully completed.
- Review the internal training annually.

Owners or generators shall maintain the following records at their facilities:

- The job title of each position at the facility relating to hazardous waste management and the name of the person(s) filling each job.
- A written description for each job.
- A written description of the type and amount of both introductory and continuing training that will be given to each person filling each job position.

- Records that document completion of the required training.

Guidance

Owners should use the [Training Plan for SNL/NM Less-Than-90-Day Accumulation Areas](#) to identify the training applicable to Members of the Workforce.

CONTAINERS

Requirements

Members of the Workforce who store [hazardous waste](#) at a less-than-90-day accumulation area shall place waste inside containers.

The containers shall be:

- Chemically compatible with the waste.
- In good condition and leak free. A container in good condition has no dents, creases, or corrosion that would compromise the integrity of the container. Minor dents and/or surface corrosion are acceptable. If a container holding hazardous waste is not in good condition or if it begins to leak, the waste shall be transferred to a container that is in good condition.
- Closed, except to actively add or remove waste. A closed container will not allow any waste to escape into the environment.
- Handled and stored in a manner that will not cause the container to rupture or leak.
- Free of external chemical contamination (i.e., all waste shall be inside its container).
- Equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in

the closed position there are no visible holes, gaps, or other open spaces into the interior of the container.



MARKINGS

Requirements

Each container of hazardous waste stored at a less-than-90-day accumulation area shall be clearly marked with the following:

- The date upon which the container was placed in the less-than-90-day accumulation area.
- The words "Hazardous Waste."

In addition, the required markings shall be visible for inspection.



Guidance

Members of the Workforce who are owners or [generators](#) should observe the following guidelines:

- There should be no other markings on a container that can be confused with the date upon which accumulation began.
 - The hazardous waste label may be used to satisfy the requirements for marking hazardous waste.
-

TIME LIMIT



Requirements

Hazardous waste shall not be stored at a less-than-90-day accumulation area for greater

than 90 days. It is possible to obtain a 30-day extension to the time limit in special cases (i.e., when it is not possible to remove the waste within 90 days). Requests for the 30-day extension shall be made before the sixtieth day, or as soon as possible, by contacting the appropriate [Division ES&H Team](#) environmental protection representative.

Guidance

Owners of less-than-90-day accumulation areas should request disposal of all waste before the sixtieth day of its storage to ensure that the 90-day time limit will not be exceeded.

PREPAREDNESS AND PREVENTION

Requirements

Members of the Workforce shall maintain and operate less-than-90-day accumulation areas to minimize the possibility of fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste to air, soil, or surface water that could threaten human health or the environment.

Less-than-90-day accumulation areas shall be equipped with the following:

- Internal communications or an alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel.
- A telephone, cellular telephone, or hand-held two-way radio capable of summoning emergency assistance from the SNL Emergency Operations Center (911 or 844-0911).
- Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment.
- Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems.

All communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment shall be tested and maintained as necessary to ensure proper operation during an emergency.

Whenever hazardous waste is being handled, all personnel involved in the operation shall have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee.

Whenever there is just one employee present during operations, that employee shall have immediate access to a telephone, cellular telephone, or hand-held two-way radio capable of summoning external emergency assistance.

Aisle space shall be maintained to allow unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area during an emergency.



*CONTINGENCY PLAN

Requirements

Members of the Workforce who are owners or generators of [hazardous waste](#), in cooperation with their [Division ES&H Team](#) representative, shall write a contingency plan designed to minimize hazards to human health and the environment by describing the actions personnel shall take to mitigate an emergency resulting from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste to air, soil, or surface water.

The provisions of the contingency plan shall be carried out immediately in the event of a fire, explosion, or release of hazardous waste that could threaten human health or the environment.

The [Less-Than-90-Day Accumulation Areas site-specific and SNL site-wide](#) contingency plans shall be maintained at the following locations:

- The less-than-90-day accumulation area
- The SNL/NM Emergency Operations Center (EOC)

The contingency plan shall be reviewed and amended as necessary, whenever:

- Applicable regulations are revised.
- The plan fails in an emergency.
- The facility changes with respect to design, construction, maintenance or operation in a way that increases the potential for fires, explosions, or releases of hazardous waste, or when the type of response that would be necessary in an emergency changes.
- The list of emergency coordinators or their telephone numbers changes.
- The list of emergency equipment changes.

Guidance

Members of the Workforce who are owners should use the [Site-Wide Contingency Plan for Less-Than-90-Day Accumulation Areas at SNL/NM](#).

EMERGENCY COORDINATOR

Requirements

Members of the Workforce who are owners or generators of [hazardous waste](#) shall designate one or more employees as emergency coordinators.

The emergency coordinators shall be:


- At all times, either on the facility premises or on call and able to reach the facility within a short period of time.
- Responsible for coordinating emergency response measures until the EOC-designated incident commander arrives and takes over.

- Familiar with all aspects of the contingency plan, facility operations, locations and characteristics of the waste, location of records, and facility layout.
-

INSPECTIONS

Requirements

Members of the Workforce who are owners shall:

- 
- Inspect areas where containers are stored at least weekly, looking for leaks and for deterioration caused by corrosion or other factors.
 - Document the weekly inspection (include date, time, and signature) and maintain the documentation in a file.
 - At the time containers are accepted, inspect the containers and their closure devices for visible cracks, holes, gaps, or other open spaces into the interior of the container when the closure devices are secured in the closed position.

If a defect is detected for the container or closure devices, at the time of inspection, the owner shall:

- Make first efforts at repair of the defect no later than 24 hours after detection.
- Complete the repair as soon as possible and no later than five calendar days after detection.
- Note the repair in the inspection log.



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ES&H Manual

SECTION 2C - CONTROL HAZARDS

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MN471001, Issue B

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* Indicates a substantive change

- [Safety Management Function](#)
 - [*Control Measures](#)
 - [Engineering Controls](#)
 - [Administrative Controls](#)
 - [Authorization Basis](#)
 - [References](#)
-

SAFETY MANAGEMENT FUNCTION

Guidance

Managers should be aware that "control hazards":

- Is the third safety management function of Sandia's Integrated Safety Management System (ISMS) (see [CPR 400.1.2](#), *Integrated Safety Management System [ISMS] Description*).
- Comprises those processes, programs, and activities related to:
 - Identifying standards and requirements.

- Establishing controls to prevent and mitigate hazards.
- Implementing work control prerequisites.

Managers should see [CPR001.3.4](#), *The Corporate Work Process (CWP)*, for additional information.



*CONTROL MEASURES

Guidance

Eliminate the hazard; if not possible, use controls to prevent or mitigate.

Managers should be aware of the following regarding [control measures](#):

- Hazard control measures should be considered in the following order:
 1. Passive engineering controls.
 2. Active engineering controls.
 3. Administrative controls.
 4. Personal protective equipment.
- [Engineering controls](#) are more reliable than [administrative controls](#).
- [Barriers](#) and automatic controls (e.g., interlocks) are more reliable than controls that rely on manual activation.

Effective interim protective measures and hazard controls are implemented until permanent controls and final abatement actions are in place or completed. See Section 13A, "Hazards Identification and Classification Process."

Managers should use a [graded approach](#) in determining which control measures are the most appropriate for mitigating potential hazards within the context of applicable



requirements. See [Section 13A](#), "Hazards Identification and Classification Process," for more information.

Technical Work Documents (TWDs)

Guidance

Managers should see the following for information on [technical work documents \(TWDs\)](#):

- [Chapter 21](#), "Technical Work Documents (TWDs)."
- CPR400.1.1.1/[GN470098](#), *Developing ES&H Procedures*.

*Training and Qualifications

Requirements

Managers shall:

- Provide the means for **MOWs** to **receive** the training and necessary qualifications for working effectively and safely.
- Identify appropriate training requirements and qualifications for **MOWs**.
- Prohibit MOWs from participating in any Sandia activities unless they are properly trained and qualified. Adequately escorted MOWs may be temporarily permitted on a case-by-case basis for either activity observation or mentoring (e.g., On-the-Job Training [OJT]).

Note: Untrained MOWs may temporarily work under the direct supervision of an appropriately qualified MOW. See [Chapter 11](#), "ES&H Training," for additional information.

Guidance

Members of the Workforce and managers should see individual sections of this manual for information on required and recommended training for specific hazards, activities, and facilities or space. **MOWs** and managers should see [Chapter 11](#), "ES&H Training," for details on:

- Requesting training exemptions.
- Accepting equivalent training.
- Developing corporate training courses.
- Determining training for contractors (see [Contractor Training Instructional Aid](#) for details).
- Establishing an OJT Program.

ENGINEERING CONTROLS

Building Controls

Guidance

Managers should consult with their [building manager](#) at SNL/NM or the facilities support contact at other sites to:

- Document building controls necessary to support programmatic operations and equipment.
- Arrange appropriate service levels (e.g., critical maintenance).

Note: An Internal Lease Agreement (ILA) can document these services. See [CPR400.4.2](#), *Space and Land Management Manual*, for more information.

Programmatic Equipment

Guidance

Managers should contact their [Division ES&H Team](#) for additional guidance on:

- Installation, management, and maintenance of interlocks and alarms required for programmatic equipment.
- Development of adequate operating and maintenance procedures.



ADMINISTRATIVE CONTROLS

Control Signs

Guidance

Members of the Workforce and managers should see the following for information on signs required by ES&H programs:

Activity	Reference
Administrative control locking	CPR400.1.1.7/ GN470037 , <i>Administrative Control Procedure</i> .
Building profiles	Chapter 15 , "Emergency Preparedness and Management"
Chemical inventory	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Confined spaces sign	Section 6I , "Confined Space Entry"
Explosives	Chapter 9 , "Explosives Safety"
Fire protection	Chapter 5 , "Fire Protection"
Hazardous chemicals	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Lasers	Section 6G , "Lasers and Intense Light"

Local exhaust ventilation	Section 6P , "Local Exhaust Ventilation (LEV)"
Noise	Section 6H , "Noise Exposure and Hearing Conservation"
Particularly hazardous substances	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Radiation protection	CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual</i> , Chapter 2 , "Posting and Labeling for Radiological Control"
Sandia Workplace Hazard Awareness System (SWHAS) signs and industrial safety signs, signals and tags	Section 4M , "Signs (Including SWHAS) and Tags"

Labels

Requirements

Members of the Workforce shall:

- **Not** label building piping systems unless authorized to do so through their [building manager](#) or other facilities support contact.
- Contact their [building manager](#) or other facilities support contact if they suspect that facilities system labels are missing or incorrect.

Guidance

Members of the Workforce should see the following for requirements and guidance on labeling hazardous material containers:

- CPR001.3.3, *Formality of Operations Manual*, [Chapter 18](#), "Equipment and Piping Labeling."
- CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.
- [Section 6D](#), "Hazard Communication Standard."

- [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan."
- [Section 10J](#), "Registering, Naming, and Labeling Bulk Storage Tanks."
- [Chapter 12](#), "Packaging and Transportation of Hazardous Material."
- [Section 19A](#), "Hazardous Waste Management."

Members of the Workforce should consult with their [building manager](#) at SNL/NM or facilities support contact at other sites for programmatic system labeling.

Control Locking

Guidance

Members of the Workforce should see [Section 4C](#), "Lockout/Tagout" and [CPR400.1.1.7/GN470037, Administrative Control Procedure](#).

Personal Protective Equipment (PPE)

Guidance

Members of the Workforce should see [Section 4L](#), "Personal Protective Equipment (PPE)," for information on general requirements and training for use of PPE and specific requirements for eye and face protection. This section provides cross-references to specific *ES&H Manual* sections and supplements that address PPE-related requirements for the following:

- Inhalation hazards.
- Cryogenic hazards.
- Intense light hazards.
- Bloodborne pathogen hazards.
- Noise hazards.

- Welding and cutting hazards.
 - Radiological hazards.
 - Electrical hazards.
-

AUTHORIZATION BASIS

Authorization Basis Documents

Requirements

Managers shall ensure that all required Authorization Basis documents (see [Attachment 13C-1](#), "Required Documentation and Authorization Authority by Hazard Classification") are completed and approved for all operations according to their hazard classification.

Operational Limits

Guidance

Managers should:


- Establish operational limits in their Authorization Basis documentation, which may require DOE approval.
- Consult their [Division ES&H Team](#) for guidance regarding permissible uses for various occupancy classifications.

See [Section 13C](#), "Authorization Basis Process," for more information.

Configuration of Controls

Guidance

Managers should be aware that:

- 
- Reliability of hazard controls also depends upon the proper alignment, use, testing, and maintenance of programmatic equipment and systems in accordance with their documented design bases (e.g., drawings, specifications, operating instructions). Consult the appropriate [building manager](#) for assistance when the configuration includes facilities-owned equipment or systems.
 - Specific requirements and standards govern configuration of controls for some operations and facilities, such as radiological waste operations. Consult the appropriate [Division ES&H Team](#) for guidance.
 - CPR001.3.3, *Formality of Operations Manual*, [Chapter 8](#), "Control of Equipment and System Status," addresses requirements and guidance for configuration of controls involving nuclear facilities, moderate- or high-hazard nonnuclear facilities, and accelerator facilities.
-



REFERENCES

Requirements Source Documents

SNL, [DE-AC04-94AL85000](#), *M&O Operating Contract Between Sandia Corporation and DOE*.

Implementing Documents

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

Related Documents

SNL, [CPR001.3.4](#), *The Corporate Work Process (CWP)*.





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ATTACHMENT 4N-18 – HYDRAULIC AND ARBOR PRESS

Subject Matter Expert: [David Sepulveda](#); CA Counterpart: [Terry L. Garner](#)

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Review Date: November 13, 2006

Administrative Changes: [June 13, 2007](#)

In addition to these safety practices and guard requirements, follow instructions in applicable activity-specific technical work documents (TWDs) and manufacturers' manuals.

CAUTION

CAUTION: Do **not** exceed the maximum pressure rating for the press or use unapproved press parts. Failure of the hydraulic hoses or connectors, the pressure cylinder, or the piece of material being pressed due to excess pressure could produce high-velocity fragments that would be extremely hazardous to Members of the Workforce. High-velocity jets of hydraulic fluid could also be formed which could cause personal injury or vaporize and produce a fire.

Safety Practices:

- Wear approved safety glasses.
- Do **not** wear neckties, loose sleeves, or loose-fitting garments.
- Roll up long sleeves above the elbow.
- Do **not** wear jewelry such as rings, bracelets, wristwatches, or necklaces.

- Contain long hair; do **not** allow it to hang loose.
- Check that the area around the press is free of clutter, tripping hazards, soiled rags, and flammable or combustible material.
- Locate the power shut-off switch and pressure release valve before machine operation.



- Inspect the press for defects before machine operation.
- Ensure that the press table is at the correct height and that all pins are properly installed in the holes in the press table.

Note: The press cylinder should not be at its full extension when you perform an operation.

- Ensure that the material to be pressed is level and centered under the hydraulic ram. Bring the ram into contact with the material manually with the hand wheel, where appropriate.
- Ensure that the material to be pressed is properly shielded. The shielding should be properly installed around the pressure cylinder, pressure pump, hoses, and fittings.



- Use only approved press parts. Do **not** use metal scraps, pipe nipples, or other material to aid in the press operation..
- Prior to use, energize the pressure pump (where appropriate) and let it remain idle for 2 minutes to warm the hydraulic fluid.
- Engage and release the load slowly; watch the work piece to ensure that it has not shifted position and that the ram is proceeding evenly..
- Observe the load on the pressure gauge. Do **not** exceed the maximum rating for the press or operate in the "red" area of the gauge.
- Do **not** leave material under pressure in the press unattended.
- Turn the pump off when the pressing operation is completed.



- Clean up the machine and work area after the pressing operation is complete.
- Report all equipment operation problems to management; tag the equipment for non-use and lock it out as necessary.

Guard Requirements:

- Ensure that presses have point of operation guards that prevent entry of hands or fingers into the point of operation.
- When a safety factor of at least 4 (or that the guard can withstand 4 times the pressure that is applied in the operation) for pressure hardware is not practical, ensure that adequate shielding and barriers are used around the material being processed.



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ES&H Manual


SECTION 10L – MANAGEMENT OF EXCESS METALLIC LEAD

Subject Matter Expert: [Bill Suderman](#); CA Counterpart: [Mark Brynildson](#)
Contributors: [Martin Brennan](#), [Dave Castillo](#), [Toff Garcia](#), [Michael Spoerner](#)
MN471001, Issue F
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* Indicates a substantive change

- 
- [Applicability](#)
 - [Identification](#)
 - [Outdoor Handling and Storage](#)
 - [*Indoor Handling and Storage](#)
 - [Request for Collection](#)
 - [New Metallic Lead Purchases](#)
 - [Related Hazards and Activities](#)
 - [References](#)
 - Forms
 - SF 2001-CTR, Lead Transfer Request ([Word file](#)/[Acrobat file](#))
-

APPLICABILITY



This section applies to all activities performed by Members of the Workforce at SNL/NM and SNL/CA where [metallic lead](#) is deemed to be excess and will be sent to the lead bank. Metallic lead shall be deemed excess when there is no current, planned or proposed use.

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

At SNL/NM, scrap lead solder is managed in accordance with the requirements for solder scrap as stated in [Section 19A](#), "Hazardous Waste Management."

This section **does not** apply to:

- KTF, where the U.S. Navy handles all excess material, including metallic lead.
- Other locations, such as TTR, WIPP, and Pantex, where excess metallic lead is managed in accordance with procedures for that site's activities.

Note: The requirements of this section apply to the management of excess metallic lead at other SNL locations, such as TTR, WIPP, and Pantex, when metallic lead from those sites will be returned to SNL/NM or SNL/CA.

IDENTIFICATION

Requirements

Members of the Workforce shall:

- Handle any metallic lead that can **not** be managed as excess material in accordance with [Section 19A](#), "Hazardous Waste Management."
- Assume that all excess [metallic lead](#) is radioactive until it has been cleared, following a radiological release survey.
- Contact the appropriate organization to request a radiological release survey of any excess metallic lead as follows:
 - At SNL/NM, contact the appropriate [Division ES&H Team](#).

- At SNL/CA, contact the [ES&H Hotline](#).

At SNL/CA, the [Environmental Operations Hazardous/Radioactive Waste Program coordinator](#) shall manage radioactively-contaminated metallic lead as mixed waste in accordance with [GN470075](#).

Guidance

Members of the Workforce should keep knowledge-of-process documentation to expedite the reapplication process. This may include purchase requests, a certification of where the metallic lead was used and what it was used for, or any other pertinent documentation or records.



OUTDOOR HANDLING AND STORAGE

Requirements

Members of the Workforce shall clearly mark excess [metallic lead](#) as excess lead.

Since metallic lead is leachable, Members of the Workforce shall supply appropriate cover, as follows, when metallic lead is stored outdoors so that it is not subject to the effects of the elements such as wind and water:

- Sealed drums shall be considered the preferred mechanism for outdoor storage of lead and labeled, "Lead for Reuse."
- At a minimum, a waterproof plastic wrap shall be used that entirely covers the top, bottom, and sides of the metallic lead. The covering or designated area shall be labeled, "Lead for Reuse."
- Metallic lead shall be sufficiently covered so condensation and precipitation will not come in contact with the lead.
- All protective coverings, whether plastic or drums, shall be maintained and in good condition.
- The protective covering or the area where it is stored shall be labeled, "Lead for



Reuse."

Guidance

Members of the Workforce should contact their [Division ES&H Team](#) for guidance on occupational health concerns relating to indoor storage of lead. See [Section 6D](#), "Hazard Communication Standard," and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan," for additional information.

*INDOOR HANDLING AND STORAGE

Requirements

Members of the Workforce shall perform activities associated with the handling and storage of [metallic lead](#) in an indoor environment as follows:

Metallic lead shall be stored in a container or designated area when not in use. The area or container shall be labeled as "Lead for Reuse". Metallic lead shall be labeled "excess lead" if the following situation is true:

- The metallic lead has been declared as excess, but a transfer request has not yet been initiated.
- The metallic lead has been declared as excess, and a transfer request has been initiated or is pending, but the transfer request has not yet been completed.
- Contact their [Division ES&H Team](#) for direction regarding occupational health concerns relating to the indoor management of lead.

Note: See [Section 6D](#), "Hazard Communication Standard" and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan," for additional information.

REQUEST FOR COLLECTION

Requirements

To request pickup of excess [metallic lead](#) at SNL/NM, Members of the Workforce shall:

- Obtain and complete a Lead Transfer Request form (SF 2001-CTR) ([Word file](#)/[Acrobat file](#)) and submit it to the [lead program coordinator](#).
- Attach a copy of the results of the radiological release survey to the Lead Transfer Request form.

To request pickup of excess metallic lead at SNL/CA, Members of the Workforce shall contact the lead program coordinator.

At other sites, if excess metallic lead will be sent to SNL/NM or SNL/CA, Members of the Workforce shall contact the lead program coordinator.

NEW METALLIC LEAD PURCHASES

Requirements

Members of the Workforce shall contact the [lead program coordinator](#) for written authorization to purchase new metallic lead.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [metallic lead](#) include:

Hazard/Activity	Reference
Chemical Information System (CIS)	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Chemical or hazardous waste	Section 19A , "Hazardous Waste Management"

Generating mixed waste	Section 19C , "Mixed Waste Management"
Occupational exposure to lead	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Radiological protection	Chapter 8 , "Occupational Radiation Protection"

REFERENCES

Implementing Documents

CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, [Chapter 6](#), "Control of Radioactive Material."

Related Documents

[10 CFR 835](#), *Occupational Radiation Protection*.

[29 CFR 1910.1025](#), *Lead*.

[40 CFR 122](#), *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System*.

[40 CFR 131](#), *Water Quality Standards*.

[40 CFR 261.2](#), *Definition of Solid Waste*.

[41 CFR 101](#), *Federal Property Management Regulations (FPMR)*.

[DOE O 231.1](#), *Environment, Safety, and Health Reporting*.

[DOE O 435.1](#), *Radioactive Waste Management*.

[DOE O 450.1](#), *Environmental Protection Program*.

[DOE P 450.5](#), *Line Environment, Safety and Health Oversight*.

[DOE 5400.5](#), *Radiation Protection of the Public and the Environment*.



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*SECTION 10J – REGISTERING, NAMING, AND LABELING BULK STORAGE TANKS

Subject Matter Expert: [Randy Castillo](#) (NM); CA Counterpart: [Mark Brynildson](#)

MN471001, Issue A

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* Indicates a substantive change

- [Applicability](#)
- [Registering](#)
- [Naming](#)
- [Labeling](#)
- [Related Hazards and Activities](#)
- [References](#)
- Forms
 - SF 2001-STR, Storage Tank Registration form ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all SNL organizations that own [bulk storage tanks](#) used for storing oil, fuel, or chemicals, and transformers or other electrical equipment with a minimum capacity of 660 gallons.

This section does **not** apply to:

- Containers that are either prepackaged or filled offsite, and barcoded through the [Chemical Inventory System \(CIS\)](#).
- Dewar containers.
- Process tanks such as etching tanks, plating baths, and cleaning baths.

REGISTERING

Requirements

Managers of organizations that own [bulk storage tanks](#) shall be responsible for:

- Registering each tank with the [Chemical Information System \(CIS\)](#) at least 30 days prior to installation.
- Updating registration by completing SF 2001-STR, "Storage Tank Registration Form" ([Word file](#)/[Acrobat file](#)) at least 30 days prior to the following events:
 - Bulk storage tank is removed or decommissioned.
 - Contents of a bulk storage tank changes.
 - Location of a bulk storage tank changes.
 - Ownership of a bulk storage tank changes (e.g., new lab owner, new organization).

Guidance

Members of the Workforce should contact the [CIS Support Team](#) for information or assistance in registering bulk storage tanks.

NAMING

Requirements

Owners of [bulk storage tanks](#) shall name each tank using the following naming convention (adopted from 40 CFR 300-372):

Naming convention:	Sample tank name:
<p><i>bbb/tn-cc</i></p> <p><i>bbb</i> = Associated building number (e.g., 878, 10520) Note: For transformers, use the substation number.</p> <p><i>t</i> = Type of tank:</p> <ul style="list-style-type: none"> <li>"A" - aboveground <li>"B" - below ground (UST) <li>"C" - tank inside building <li>"E" - electrical equipment other than transformers <li>"P" - tank wagon (portable) <li>"T" - transformer <p><i>n</i> = Tank number (must be a single digit)</p> <p><i>cc</i> = Contents of tank (use code from the Storage Tank Content Codes table)</p>	<p>Sample tank name:</p> <p>878/B2-LN2</p>

Note: Transformers with existing PCB Survey Albuquerque (PSA) numbers use the PSA number in lieu of a storage tank name. See [Section 10D](#), "Polychlorinated Biphenyl (PCB) Management."

Guidance

Members of the Workforce should contact one of the following:

- [CIS Support Team](#) for assistance regarding tank contents.
- [Division ES&H Team](#) for information on the PSA numbering system.



LABELING

Requirements

Owners of [bulk storage tanks](#) shall label each tank with the tank's name. Each label shall be:

- Provided from CIS through the [CIS Support Team](#).
- Affixed to the tank (or above ground identifier on an [underground storage tank \[UST\]](#)) so that it is not visually obstructed by nearby objects.

Guidance

Members of the Workforce should contact their [CIS Support Team](#) for labeling supplies or assistance in labeling storage tanks.

Managers may consult the [facilities support](#) contact to request labeling the tanks using facility service orders.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to storage tanks include:

Hazard/Activity	Reference
Chemical Information System (CIS)	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"

Emergency response	Chapter 15 , "Emergency Preparedness and Management"
Fire protection	Chapter 5 , "Fire Protection"
Hazardous/chemical waste	Section 19A , "Hazardous Waste Management"
Leaks and spills	Section 10F , " Oil and Fuel Storage "
PCBs	Section 10D , "Polychlorinated Biphenyl (PCB) Management"
Toxic substances	Section 6S , "Toxic Substances Control Act (TSCA)"
Underground storage tanks (USTs)	Section 10K , "Underground Storage Tanks"

REFERENCES

Requirements Source Documents

[29 CFR 1910.119](#), *Process Safety Management of Highly Hazardous Chemicals*.

[40 CFR 112](#), *Oil Pollution Prevention*.

[40 CFR Subchapter J](#) - Superfund, Emergency Planning, and Community Right-to-Know Programs (Parts 300-399).

[Emergency Planning and Community Right-to-Know Act \(EPCRA\) of 1986](#) (42 U.S. Code 11001 et seq.).

National Fire Protection Association, [Uniform Fire Code](#) (NFPA 1). Quincy, MA (2003).

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ES&H Manual

ATTACHMENT 4M-1 - SANDIA WORKPLACE HAZARDS AWARENESS SYSTEM (SWHAS)

Subject Matter Expert: [Willie J. Johns](#); CA Counterparts: [Herman Armijo](#)

MN471001, Issue C

Revision Date: [December 16, 1998](#), Replaces Document Dated: July 31, 1995

Administrative Changes: November 9, 2004 and [June 14, 2006](#)

SANDIA WORKPLACE HAZARDS AWARENESS SYSTEM (SWHAS)

Requirements

Members of the Workforce shall:

- When working with hazards, post the [National Fire Protection Association \(NFPA\) Hazardous Materials Classification symbol](#), which is part of the SWHAS [sign](#).

Note 1: The NFPA Hazardous Materials Classification symbol link above and throughout this document will direct users to the Sandia Tech Library. To view the NFPA 704 standard, users must click the "Specs and Standards" link, and on the following page type NFPA 704 in the "Doc. No:" box and click "Search."

Note 2: Posting of the SWHAS sign provides a hazard awareness method for both Members of the Workforce and emergency response teams.

- Place SWHAS signs so that they are always in full view by anyone entering affected areas. If a door is routinely left open, a wall mount should be used.
- **Not** cover SWHAS signs or block them from view.
- **Not** use SWHAS signs instead of signs that are required by other ES&H programs and procedures, e.g., lasers, explosives, and ionizing radiation.

Space owners shall:

- Place a SWHAS sign in laboratory, research, or production areas where potential [physical](#) and [health hazards](#) may exist.

Note: Examples of areas that under normal conditions **do not** need SWHAS signs are: computer labs (except for those with large battery systems), custodian closets, offices, administrative and clerical work areas, libraries, rest rooms, conference rooms, auditoriums, and lunchrooms.

- Meet the minimum NFPA requirements of SWHAS, including:
 - Posting and maintaining the sign, including leaving of signs when the space is no longer owned and changing the symbols to reflect changes in hazards.
 - Applying a completed [National Fire Protection Association \(NFPA\) 704 Hazardous Materials Classification symbol](#) for the space in the upper left-hand corner of the SWHAS sign.
 - Maintaining current space owner and alternate information.
 - Ensuring that the optional hazard signs placed on the SWHAS sign reflect the hazards in the area.

Note: SWHAS signs contain six areas and have the [National Fire Protection Association 704 Hazardous Materials Classification symbol](#) in the upper left-hand corner.
- Verify that the [National Fire Protection Association 704 Hazardous Materials Classification symbol](#) is completed by providing the numerical rating in each of three colored areas and, as required, special hazards information in the white area.

Guidance

Optional Information

All information presented on the SWHAS sign, in addition to the completed [National Fire Protection Association 704 Hazardous Materials Classification symbol](#), is optional (see "[Optional Hazard Signs](#)"). The SWHAS sign is not a primary hazard communication tool. Technical work documents (TWDs) and training courses are examples of primary hazard communications. See "[Optional Hazard Signs](#)" for specific signs and guidance on when to use them. Only put [personal protective equipment \(PPE\)](#) (see [Section 4L](#), "Personal Protective Equipment (PPE)")

requirements on the SWHAS sign when they are required by persons entering the room or building.

Members of the Workforce should contact the appropriate [Division ES&H Team](#) for assistance in identifying, evaluating and controlling [physical hazards](#) and [health hazards](#) associated with [hazardous chemicals workplace assessments](#) for PPE and for additional information or interpretation of labels and [Material Safety Data Sheets \(MSDSs\)](#).

Space owners of areas containing building power distribution; heating, ventilating, and air conditioning systems; and other utilities that are the responsibility of the [Facilities Maintenance Program](#) may post SWHAS signs.

See "Hazard Identification" in [Section 2B](#), "Analyze Hazards," for additional information on identifying hazards.

Ordering Information

SWHAS signs may be obtained through the Sandia JIT System. Order numbers are:

- With outdoor UV Protector: FSS HAZ SAN W UV
(Kit includes: SWHAS sign, NFPA 704 symbol, and 3"x4" hazard signs)
- With outdoor UV Protector :HAZ SAN W UV
(Kit includes: SWHAS sign, NFPA 704 symbol, and 1" hazard signs)

Hazardous Materials Classification Symbol

1. The [National Fire Protection Association \(NFPA\) 704 Hazardous Materials Classification symbol](#) is placed in the upper left-hand corner of the Sandia Workplace Hazards Awareness System (SWHAS) [sign](#). The numbers on the [National Fire Protection Association 704 Hazardous Materials Classification symbol](#) represent the degree of severity with respect to [health](#), fire hazard and reactivity that an emergency response member would face upon entry into the area as well as general awareness to anyone entering the area. The white area beneath the Specific Hazard area is used to identify unusual reactivity with water, radiation hazard, corrosive, alkali, acid, or oxidizers. The numbers/symbols should be derived from [material safety data sheets \(MSDSs\)](#) for most of the [hazardous chemicals](#) in the area. Several hazards have very specific sign requirements, such as radiation, lasers, and [particularly hazardous materials](#). Refer to the relevant sections of this manual for requirements. For aid in determining the appropriate numerical rating and specific hazards, contact the appropriate [Division ES&H Team](#) or the [fire protection contact](#).

The colors and information presented on the [National Fire Protection Association 704 Hazardous Materials Classification symbol](#) are:

Blue - Health Hazard 4 Deadly 3 Extreme danger 2 Hazardous 1 Slightly hazardous 0 Normal material	Red - Fire Hazard (°F) Flash points: 4 Below 73 3 Below 100 2 Below 200 1 Above 200 0 Will Not Burn
White - Specific Hazard Oxidizer OX Use NO WATER W	Yellow - Reactivity 4 May Detonate 3 Shock or Heat May Detonate 2 Violent Chemical Change 1 Unstable if Heated 0 Stable

2. The bottom of the SWHAS sign has an area that contains the "ES&H Owner" and alternate owner information. The format of this information is shown in the [example](#) below. Users should provide the following information about themselves and for the alternate owner if applicable:


- Owner's name
- Organization number
- Work phone number
- Pager number
- Building number
- Room number
- Home phone number (optional)
- Date on which the information was last updated

Notes:

1. If the ES&H owner is not an SNL employee, provide the hosting organization number in the "org." position.

2. Home phone numbers are optional; however, if used, they must include all seven digits.
3. The "BLDG:" and "ROOM:" information applies to the area for which the SWHAS sign is posted.

Example:



ES&H OWNER: [owner's name, org., work phone number, pager number]


BLDG: xxx ROOM: yyy HOME: [phone number (optional)]

ALT. OWNER:

BLDG: xxx ROOM: yyy HOME: [phone number (optional)]

EMERGENCY/Fire: Dial 911 OR CELLULAR: 844-0911

Date sign was last updated:



Persons completing the sign should write legibly, using indelible markers (such as Sharpies®) rather than hand writing the information with pencils, Magic Markers® or felt tip pens, which is easily rubbed off.

Optional Hazard Signs



**WEAR
PROTECTIVE
CLOTHING**



Wear Protective Clothing:

Use this sign only when a [workplace assessment](#) has determined the need to don [personal protective equipment \(PPE\)](#), such as protective clothing, safety glasses, face protection, safety goggles, respirators, prior to entering the space and wear it while in the space.



Respirator Required:

Use this sign only when a workplace assessment has determined the need to don PPE (protective clothing, safety glasses, face protection, safety goggles, respirators) prior to entering the space and wear it while in the space.

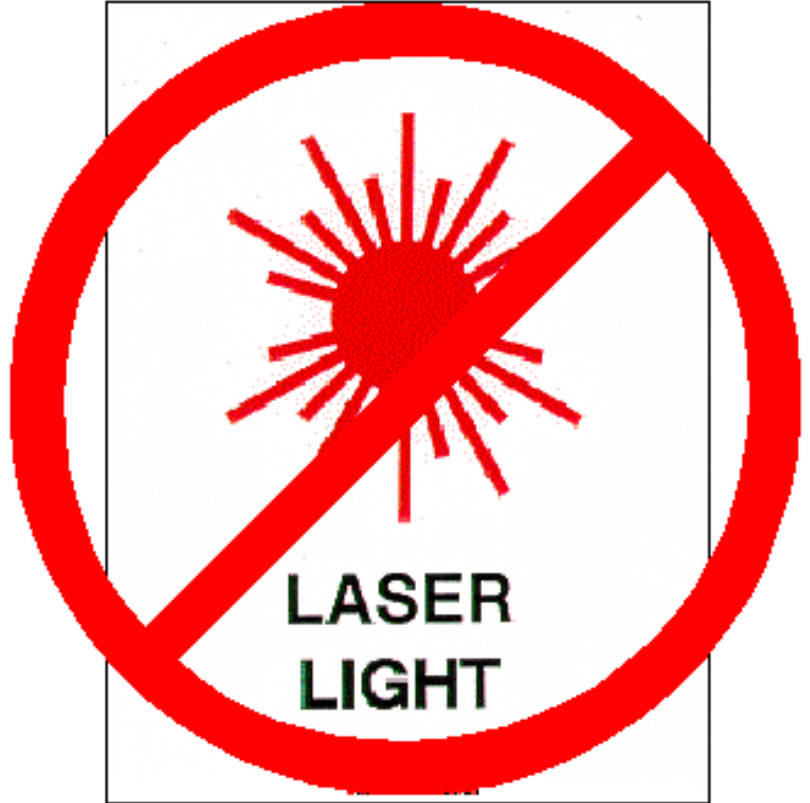


Wear Safety Goggles:

Use this sign only when a workplace assessment has determined the need to don PPE (protective clothing, safety glasses, face protection, safety goggles, respirators) prior to entering the space and wear it while in the space.

Wear Safety Glasses:

Use this sign only when a workplace assessment has determined the need to don PPE (protective clothing, safety glasses, face protection, safety goggles, respirators) prior to entering the space and wear it while in the space.



Wear Face Protection:

Use this sign only when a workplace assessment has determined the need to don PPE (protective clothing, safety glasses, face protection, safety goggles, respirators) prior to entering the space and wear it while in the space.

Laser Light:

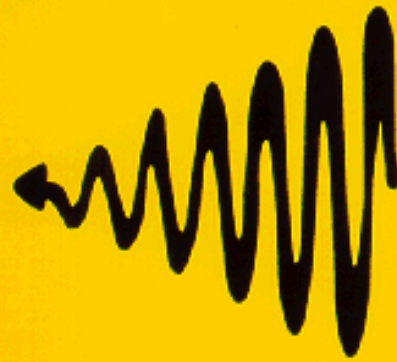
This sign does not meet ANSI Z136.1 specifications and therefore, is not recommended. Warning signs, as specified in ANSI Z136.1, are required at all entrances to laser hazard zones. See [Section 6G](#), "Lasers and Intense Light."



**MICROWAVE
RADIATION**

Microwave Radiation:

This sign is not recommended unless engineering controls, administrative controls, and/or personal protective equipment (PPE) are required to control exposure of Members of the Workforce entering the space to [nonionizing radiation \(NIR\)](#) below applicable exposure limits as defined in 1997 TLVs[®] and BEIs[®]: Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, or the latest edition.



**ULTRAVIOLET
LIGHT**

Ultraviolet Light:

This sign is not recommended unless engineering controls, administrative controls, and/or personal protective equipment (PPE) are required to control exposure of Members of the Workforce entering the space to nonionizing radiation (NIR) below applicable exposure limits as defined in 1997 TLVs[®] and BEIs[®]: Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices (or the latest edition).



Cancer Hazard:

This sign is not recommended. Work with [particularly hazardous substances](#), which include select carcinogens, reproductive toxins, and substances which have a high degree of acute toxicity, require that a designated area be established and posted with its boundaries clearly identifiable while the particularly hazardous substance is used. A Designated Area sign is not required for those areas identified as exempt from the requirements of the laboratory standard. See [Section 6D](#), "Hazard Communication Standard," and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan," for requirements.



TOXIC GAS

Toxic Gas:

This sign is not recommended. Work with particularly hazardous substances, which include select carcinogens, reproductive toxins, and substances which have a high degree of acute toxicity, require that a designated area be established and posted with its boundaries clearly identifiable while the particularly hazardous substance is used. A Designated Area sign is not required for those areas identified as exempt from the requirements of the laboratory standard. See [Section 6D](#), "Hazard Communication Standard," and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan," for requirements.



CORROSIVE MATERIALS

Corrosive Materials:

This sign is not recommended. Work with particularly hazardous substances, which include select carcinogens, reproductive toxins, and substances which have a high degree of acute toxicity, require a designated area be established and posted with its boundaries clearly identifiable while the particularly hazardous substance is used. A Designated Area sign is not required for those areas identified as exempt from the requirements of the Laboratory Standard. See [Section 6D](#), "Hazard Communication Standard," and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan," for requirements.



TOXIC CHEMICALS

Toxic Chemicals:

This sign is not recommended. Work with particularly hazardous substances, which include select carcinogens, reproductive toxins, and substances which have a high degree of acute toxicity, require a Designated Area be established and posted with its boundaries clearly identifiable while the particularly hazardous substance is used. A Designated Area sign is not required for those areas identified as exempt from the requirements of the Laboratory Standard. See [Section 6D](#), "Hazard Communication Standard," and [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan," for requirements.



**INFECTIOUS
AGENTS**



BIOHAZARD

Infectious Agents:

This sign is not recommended unless engineering controls, administrative controls, and/or PPE are required to control exposure of Members of the Workforce entering the space to biological agents, organisms, or products of organisms that present a risk to humans.

Biohazard:

This sign is not recommended unless engineering controls, administrative controls, and/or PPE are required to control exposure of Members of the Workforce entering the space to biological agents, organisms, or products of organisms that present a risk to humans.



**CHEMICAL
FREE ZONE**



EXPLOSIVE



Chemical Free Zone:

These signs have been included in the SWHAS package in the past, but their use is not recommended. Use the NFPA 704 symbol, which provides more specific information, when using chemicals.

Explosive:

This sign is used where explosives or devices containing explosives are used, packaged, handled, or stored.



High Voltage:

This sign is used where voltage greater than 600 volts exists.

Electrical Hazard:

This sign is used where Members of the Workforce are exposed to accidental contact with voltages of 50 volts or higher. (Includes lab equipment where experimenters make connections to this voltage range. Does not include equipment that is totally enclosed where no external connections are made.)

Argument: Even though connections to most lab equipment are made with connectors that do not have exposed parts (i.e., contacts are recessed to prevent contact), the other end of that cable could be stripped back for connection to an experiment.



Radiation Hazard:

Do not use this sign. See [MN471016](#), *Radiological Protection Procedures Manual, Chapter 2*, "Posting and Labeling for Radiological Control," for information about required radiological postings.

Radioactive Material:

Do not use this sign. See [MN471016](#), *Radiological Protection Procedures Manual, Chapter 2*, "Posting and Labeling for Radiological Control," for information about required radiological postings.



Flammable:

These signs have been included in the SWHAS package in the past, but their use is not recommended. Use the NFPA 704 symbol, which provides more specific information, for flammables.

No Eating or Drinking:

This sign is used in a toilet room or in any area exposed to a toxic material to remind Members of the Workforce that consumption of food or beverages is prohibited. Eating, drinking, smoking, gum chewing, or applying cosmetics in areas where laboratory chemicals are present is also prohibited.



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ES&H Manual

ATTACHMENT 15-2 – MANAGER'S CHECKLIST

Subject Matter Expert: [Carol V. Bonney](#); CA Counterpart: [Judy Acosta](#)

MN471001, Issue H

Revision Date: [August 20, 2004](#), Replaces Document Dated: June 26, 2001

Review Date: June 18, 2006

Administrative Changes: June 29, 2005, July 5, 2006, and [November 6, 2006](#)

Manager's Emergency Planning Checklist



Task

Check When Completed

Be aware of management responsibilities and actions following notification of a change in SECON threat level, as described in the SECON Implementation Plan (IP) (or organization-specific SECON IP).

Report changes to PHS/HA that affect work processes and emergency responses to SNL Emergency Management.

Ensure emergency action or emergency response plans are:

- Written and in place, as appropriate.
- Reviewed by SNL Emergency Management.
- Communicated to Members of the Workforce, as appropriate.
- Include provisions to protect special needs people, and that special needs people know



and understand these provisions.	
Ensure that all Members of the Workforce and visitors are instructed in the actions to be taken in the event of an emergency.	
Ensure evacuation teams are established and receive Sandia Protective Actions Notifications (SPAN) training (SNL/NM).	
Review applicable emergencies and situations in Attachments 15-1 , "What to Do During an Emergency" and 15-3 , "SNL/NM Building Evacuation Team Responsibilities." Note: SNL/NM has a high incidence of lightning activity. Managers may want to specifically address lightning in their technical work documents.	
Identify organization representatives, and ensure they are made available to participate in planning and conducting emergency drill and exercise events that could impact organization personnel and/or facilities.	



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ES&H Manual

ATTACHMENT 4M-2 - ISMS HAZARD NOTICE SIGN

Subject Matter Expert: [Willie J. Johns](#); CA Counterparts: [Herman Armijo](#)
MN471001, Issue C
Revision Date: [December 16, 1998](#), Replaces Document Dated: July 31, 1995
Administrative Changes: November 9, 2004 and [June 14, 2006](#)




ISMS HAZARD NOTICE SIGN

Requirements

Space owners shall:

- Place an ISMS Hazard Notice sign ([Word file/Acrobat file](#)) in a conspicuous location, e.g. entrance to work area, the purpose of which is to effectively communicate to others, the inherent and intrinsic physical and health hazards that are present within a lab, work space or are associated with a process or activity.

Note: Examples of areas that under normal conditions **do not** need an ISMS HAZARD NOTICE sign are: computer labs (except for those with large battery systems), offices, administrative and clerical work areas, libraries, rest rooms, conference rooms, auditoriums, and lunchrooms.

- 
- Place ISMS Hazard Notice signs so that they are always in full view by anyone entering the affected area. If a door is routinely left open, a wall mount adjacent to the door should be used.
 - Indicate both the physical and health hazards and the necessary Personal

Protective Equipment (PPE) or special precautions require for entry.

- **Not** cover ISMS Hazard Notice signs or block them from view.
- **Not** use ISMS Hazard Notice signs in place of signs that are required by other ES&H programs, e.g., lasers, explosives, or ionizing radiation.
- **Not** use the ISMS Hazard Notice signs in place of the National Fire Protection Association (NFPA) 704 Hazardous Materials Classification symbol.
- **Not** make hand written changes to the ISMS Hazard Notice signs, but will communicate to their ES&H Coordinator any and all changes necessary and will request a new ISMS Hazard Notice sign be generated for subsequent posting.



Guidance

Members of the Workforce should contact the appropriate [Division ES&H Team](#) for assistance in identifying, evaluating and controlling physical hazards and health hazards.

See "[Hazard Identification](#)" in Section 2B, "Analyze Hazards," for additional information on identifying hazards.



COMPLETING ISMS HAZARD NOTICE SIGN

Requirements


Space owners shall:


- Specify the physical or health hazards present by filling in the box next to the applicable hazard with the ISMS Star based on the criteria listed below (see the ISMS Hazard Notice sign [[Word file](#)/[Acrobat file](#)]): **HAZARDS PRESENT (TOP SECTION)**
 - **Designated Area** - Fill in this box if the work area is governed by the OSHA Lab Standard **and** chemicals used in the area are listed as "particularly



hazardous substances." To determine if the chemicals used in your work are considered "particularly hazardous substances", you need to conduct a query of your [chemical inventory](#), see (<https://webprod.sandia.gov/CIS/svStartup>) and request the SNL/CA Particularly Hazardous Substances list for your specific work area or chemical storage location.

- **Reactive Chemicals** - Fill in this box to indicate that acids, bases, oxidizers, peroxide forming compounds, etc. are present in significant quantities, i.e. 5 gallons in total, or that unusual usage situations exist.
- **Flammables** - Fill in this box to indicate the presence of a combined volume of at least 1-gallon of flammable liquids.
- **High Noise** - Fill in this box to indicate the presence of a high noise source, > 85dBA, either on a continuous or irregular basis. Designate the requirement for the use of hearing protection below in the Personal Protective Equipment and Precautions section.
- **High Pressure** - Fill in this box to indicate the presence of high pressure systems exceeding 3000 psi for gasses or exceeding 5000 psi for liquids.
- **Electrical sources** - Fill in this box to indicate a potential for exposure to high voltage sources, capacitors, battery banks, etc. greater than 600 volts.
- **Other: List** - Fill in this box **AND** specify the specific hazard to indicate the presence of the specific hazard. Examples are as follows:
 - **Biohazards** - infectious agents, human fluids or specimens.
 - **Moving Machinery** - equipment having the potential for exposed moving parts.
 - **Radio frequency** - (RF) fields that warrant special precautions. Contact the appropriate Division ES&H Team for assistance in determining the need for posting for RF fields.
 - **Magnetic fields** - (> 5 Gauss) fields which warrant special precautions.
 - **Welding Arcs**

- 
- **Ultraviolet light** which may warrant protection of the eyes or skin.
 - **Thermal hazards**, e.g. hot surfaces, or cryogenics.
 - **Other hazards** which may warrant special precautions or PPE.
- Specify the need for precautions or PPE by filling in the box next to the applicable control with the ISMS Star based on the criteria listed below:
 - **Safety Glasses Required** - Fill in this box to indicate the mandatory use of eye protection for entry into the area.
 - **Hearing Protection Required** - Fill in this box to indicate to the mandatory use of Hearing Protection. You must indicate with a '•', if the use is 'required for entry' (e.g. mechanical rooms) or required 'when equipment is in use'(e.g. machine shops.)
 - **No Eating or Drinking** - Fill in this box to indicate that consumption or storage of food and drink is prohibited in this area. GN470094, Chemical Handling at SNL/CA, prohibits eating, drinking, chewing gum, smoking, or application of cosmetics in chemical work or storage areas. Office areas and control rooms within a chemical handling area may be posted to allow the consumption of food and beverage if the area is distinctively separated from chemical handling area.
 - **Other** - Fill in this box **AND** specify any additional PPE or precautions required for entry such as:
 - Pacemakers and medical implant alert
 - Hardhats
 - Specify the applicable OSHA Standard by marking the appropriate box.



Maintenance, construction, and custodial areas, hazardous waste facilities, environmental restoration sites, and Security's SPO activities are governed by the Hazards Communication Standard. All other research and support activities that involve the use of chemicals are governed by the Lab Standard.

- Specify the Space Owner and an alternate.
-



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ES&H Manual

SECTION 6H - NOISE EXPOSURE AND HEARING CONSERVATION

Subject Matter Expert: [Brad Lackey](#); CA Counterpart: [Daniel Kuey](#)

Contributor: [Chad Hjorth](#)

MN471001, Issue E

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Administrative Changes: April 2, 2004, November 16, 2005 and [December 1, 2006](#)



* Indicates a substantive change

- [Applicability](#)
- [Training](#)
- [*Hearing Conservation Program](#)
- [*Noise Monitoring](#)
- [Noise Control and Hearing Protection](#)
- [*Audiometric Testing](#)
- [*Related Hazards and Activities](#)
- [*References](#)

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who are exposed to [high-noise](#) or [high ultrasound levels](#).

TRAINING

Work Activity or Role	Required	Recommended
Managers of Members of the Workforce enrolled in the Hearing Conservation Program	N/A	NSE100
Members of the Workforce who are exposed to high-noise or high ultrasound levels	NSE100 (annually)	N/A
Members of the Workforce participating in the Hearing Conservation Program	NSE100 (annually)	N/A

*HEARING CONSERVATION PROGRAM (HCP)

Requirements

Managers shall identify Members of the Workforce who have been exposed to [high-noise](#) or [high ultrasound levels](#) to be enrolled in the HCP. For purposes of enrollment in the HCP, personal noise exposures are determined without regard to [attenuation](#) provided by the use of hearing [protection](#) or other [appropriate](#) personal protective equipment ([PPE](#)). Participation in the HCP involves proper use of [hearing protection](#), audiometric testing, annual training, and monitoring noise levels as described in this document. The use of hearing protection to mitigate noise exposure does **not** excuse Members of the Workforce from participating in HCP.

Refer to Section 6E, "Laboratory Standard - Chemical Hygiene Plan," under the topic, "[Ototoxic Chemicals](#)," for additional guidance on [ototoxic chemical](#) exposures that are either alone or in concert with high-noise or high ultrasound noise levels.

Guidance

Managers should:

- Consult the appropriate [Division ES&H Team](#) industrial hygiene representative to:
 - Determine if Members of the Workforce are required to participate in the HCP.
 - Request removal of Members of the Workforce from the HCP who are no longer exposed to high-noise or ultrasound noise levels.
 - Obtain assistance and recommendations regarding Members of the Workforce who work with [ototoxic chemicals](#) either by itself or in concert with high-noise or ultrasound.
- At SNL/CA, contact Benefits and Health Services (8527) by internal memorandum to request HCP enrollment or removal for Members of the Workforce.

Note: The Center ES&H Coordinator and the appropriate Division ES&H Team industrial hygiene representative should be included on the memorandum distribution list.

*NOISE MONITORING

Requirements

Managers shall be responsible for ensuring that:

- Noise levels are monitored whenever
 - Information indicates that Members of the Workforce may be exposed to [high-noise](#) or [high ultrasound levels](#).
 - A change in production, process, equipment, or controls increases noise exposures so that additional Members of the Workforce may be exposed to

high-noise and high ultrasound levels.

- Affected Members of the Workforce are provided with an opportunity to review the results of noise measurements.
- An accurate record of all exposure measurements is maintained for affected Members of the Workforce.



Guidance

Managers should contact the appropriate [Division ES&H Team](#) industrial hygiene representative to conduct noise monitoring.

Note: Industrial hygiene noise monitoring records are generated for individual noise hazard exposures and are represented by monitoring results that are evaluated by the Division ES&H Team industrial hygiene representative. These records are maintained by the ES&H and Emergency Management Center, Industrial Hygiene & Safety Programs Department (3122). Members of the Workforce exposure measurement records are also maintained at Sandia Health Services.



NOISE CONTROL AND HEARING PROTECTION

Requirements

Managers shall be responsible for ensuring that:

- Members of the Workforce exposed to [high-noise](#) or [high ultrasound levels](#) are enrolled in the [Hearing Conservation Program \(HCP\)](#).
- Engineering or administrative controls are used when feasible when SNL personnel are subjected to high-noise or high ultrasound levels.

- Personal protective equipment (PPE) is provided and used to reduce sound levels below the appropriate [threshold limit values \(TLV\)](#) if engineering or administrative controls fail to reduce sound levels below the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for



noise.

- Hearing protectors attenuate employee exposure to at least an 8-hour time-weighted average of 85 decibels (A-weighted).
- A variety of suitable hearing protectors are made available to Members of the Workforce.
- Hearing protectors are fitted properly and used correctly.
- Hearing protectors are replaced, as necessary.
- Members of the Workforce receive training in the proper use and care of hearing protectors provided.
- Use of hearing protectors is re-evaluated whenever noise exposure increases to the extent that they may no longer provide adequate attenuation.



Guidance

Managers should:

- Consult the [facilities support contact](#) and the industrial hygiene representative on the appropriate [Division ES&H Team](#) for assistance in implementing engineering controls.
- Consult the industrial hygiene representative on the appropriate [Division ES&H Team](#) for assistance with evaluating the adequacy of hearing protection using one of the methods of evaluation as described in [29 CFR 1910.95, Appendix B](#).
- Consider the high-noise or high ultrasound level hazards that will be introduced to work locations when procuring noise generating equipment.



Note: Addition of noise generating equipment can increase the total noise exposure of Members of the Workforce; make additional noise evaluations necessary; and make hearing protection ineffective. Additional guidance on hazardous requirement considerations appear in CPR500.2.1, *Procurement Manual*.



- Ensure that signs are posted to alert individuals where devices and equipment that generate high-noise or high ultrasound levels are present.
-

*AUDIOMETRIC TESTING

Requirements

Managers shall be responsible for ensuring that:

- Members of the Workforce receive:
 - Baseline audiograms within 6 months of their first exposure to high-noise or [high ultrasound levels](#).
 - New audiograms at least annually thereafter while enrolled in the Hearing Conservation Program (HCP).
- Members of the Workforce suffering a [standard threshold shift](#) are:
 - Retested within 30 days.
 - Fitted with hearing protectors if not already using them, and trained in their use and care.
 - Refitted with hearing protectors if greater [attenuation](#) is needed.
 - Retrained in the use of the hearing protectors.



Guidance

Managers should consult Occupational Health Programs (3335), or Benefits and Health Services (8527), or the industrial hygiene representative on the appropriate [Division ES&H Team](#) for audiometric testing, retesting, retraining and assistance with refitting hearing protection.

*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to noise exposure and hearing conservation include:

Hazard/Activity	Reference
Personal protective equipment	Section 4L , "Personal Protective Equipment (PPE)"
Safety signs	Section 4M , "Signs (Including SWHAS) and Tags"
Ototoxic chemicals	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Power tools and machinery	Section 4N , "Industrial Machines and Portable Power Tool Safety"
Heavy machinery operation	Section 4R , "Light and Heavy Earth Moving Equipment"
Firearms-related hearing protection	Section 4T , "Firearms Safety"
Aviation safety	Section 4U , "Aviation Safety"
Medical evaluation/testing	Chapter 16 , "Health, Benefits, and Employee Services"
Procurement Manual	CPR500.2.1 , "Procurement Manual"

*REFERENCES

Requirements Source Documents

[29 CFR 1910.95](#), *Occupational Noise Exposure*.

ACGIH (American Conference of Governmental Industrial Hygienists), *2000 TLVs® and BEIs®: Threshold Limit Values for Chemical Substances and Physical Agents*, "Biological Exposure Indices," Cincinnati, OH, 2000 or latest edition.

[DOE Order 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

 SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program*.

SNL, [OP-MED048](#), *Hearing Conservation Program*.

Related Documents

Health and Human Services, U.S. Department of; Public Health Service; Centers for Disease Control and Prevention (CDC); National Institute for Occupational Safety and Health (NIOSH), "Compendium of Hearing Protection Devices," May 1994.

U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health (NIOSH), "Publications on Noise and Hearing," July 1991.



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Corporate Process Requirement No: CPR400.1.1
Sponsor: Dori Ellis, 4000, Acting

Revision Date:
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 IMPORTANT NOTICE: A printed copy of this document may not be the document currently in effect. The official version is located on the Sandia Restricted Network (SRN) and watermark-controlled.

ES&H Manual

CHAPTER 8 – OCCUPATIONAL RADIATION PROTECTION

 Subject Matter Expert: [Brad Elkin](#); CA Counterpart: [Toff Garcia](#)

MN471001, Issue J (I not used)

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* Indicates a substantive change

- [*Applicability](#)
 - [Radiation Protection](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to activities and facilities that involve occupational radiation exposure, including the activities of [radiological workers](#), the facilities where [radiological work](#) is performed, and [nuclear facilities](#).

This section does not apply to SNL nuclear criticality safety, which is addressed in [GN470072](#), *Nuclear Criticality Safety*.

RADIATION PROTECTION

Requirements

Members of the Workforce shall follow the requirements for SNL activities that involve occupational radiation protection that are presented in [MN471016](#), *Radiological Protection Procedures Manual* which implements the requirements of [10 CFR 835](#), *Occupational Radiation Protection*.

Guidance

Members of the Workforce should consult their [Division ES&H Team](#):

- For assistance in identifying [radioactive material](#).
- With questions regarding radiation protection.

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Packaging and transportation of hazardous material	Chapter 12 , "Packaging and Transportation of Hazardous Material"

REFERENCES

Requirements Source Documents

[10 CFR 820](#), *Procedural Rules for DOE Nuclear Activities*, Appendix A, "General Statement of Enforcement Policy."

[10 CFR 835](#), *Occupational Radiation Protection*.

Implementing Documents

[MN471001](#), *ES&H Manual*:

- [Chapter 12](#), Packaging and Transportation of Hazardous Materials.
- [Section 18G](#), Reporting Nuclear Safety Rule Noncompliances.

[MN471016](#), *Radiological Protection Procedures Manual*.

SNL, PG470193, *SNL Radiation Protection*, [10 CFR 835](#), *Occupational Radiation Protection*, Issue A, September 30, 1996.

Related Documents

[CPR 500.2.3](#), *Property/Assets User's Manual*, "Identifying and Removing Excess Property."

[MN471001](#), *ES&H Manual*:

- [Section 6C](#), "Respiratory Protection."
- [Section 6P](#), "Local Exhaust Ventilation (LEV)."

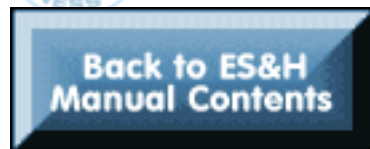
- [Chapter 13](#), "Hazards Identification/Analysis and Risk Management."
- [Chapter 15](#), "Emergency Preparedness and Management."
- [Chapter 17](#), "Air Emissions."
- [Chapter 18](#), "Reporting, Investigating, and Correcting ES&H Events."
- [Chapter 19](#), "Waste Management."

[CPR400.1.1.7/GN470037](#), *Administrative Control Procedure.*

[CPR4001.1.11/GN470072](#), *Nuclear Criticality Safety.*

[GN470089](#), *Startup and Restart Process for Sandia Nuclear Facilities/Activities.*

[CPR001.3.3](#), *Formality of Operations Manual.*



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SECTION 18C – OCCURRENCE REPORTING

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MN471001, Issue G

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Administrative Changes: [March 9, 2006](#)

 * Indicates a substantive change

- [Applicability](#)
- [*Training](#)
- [*Ownership of Occurrence Reports](#)
- [* Handling Events](#)
- [*Supporting DOE Investigations](#)
- [*Non-Occurrence Trackable Event \(NOTE\)](#)
- [Related Hazards and Activities](#)
- [*References](#)
- [*Attachments](#)
 - [18C-1](#) - Accident Investigation Criteria
 - [*18C-2](#) - [Occurrence Reporting Model](#)
 - [18C-3](#) - Initial Accident Scene Investigation
 - [*18C-4](#) - [Example Investigation Hold Tag](#)



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who identify, report, or own [occurrences](#).



*TRAINING

Work Activity or Role	Required	Recommended

Facility manager/designee (FM/D)	FM/D training on Occurrence Management (OM) website . [D - DOE M 231.1-2]	N/A
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*OWNERSHIP OF OCCURRENCE REPORTS



Note: A [facility manager](#), with respect to [occurrence reporting](#) and related processes, is the vice president who is responsible for the division where the occurrence happened. Facility managers may delegate occurrence-reporting responsibilities to a designee who is a center director or below.

Requirements

Center directors to whom facility managers delegate occurrence reporting responsibilities shall be responsible for ensuring the quality, accuracy, and approval of final occurrence reports.

When facility managers delegate occurrence reporting responsibilities to a designee other than a center director, the designee's center director shall be responsible for ensuring the quality, accuracy, and approval of final occurrence reports.



*HANDLING EVENTS

Requirements

[Facility managers/designees](#) shall:

- Own all [occurrences](#) within the areas that are under their control.
- Determine whether [events](#) within areas that are under their control qualify as [reportable occurrences](#) according to the [Occurrence Management Reporting Criteria](#) (formerly Occurrence Management Categorization Matrix).

Note: See the OM website for [reporting time constraints](#).

- Be responsible for ensuring that the requirements of [Attachment 18C-2](#), "Occurrence Reporting Model," are followed for events that are classified as reportable occurrences and that:
 - DOE/NNSA Sandia Site Office (SSO) is notified according to the reporting requirements listed on the OR model.

Note: See the notification process and list of SSO facility contacts, including facility representatives at the OM [website](#).

- The Sandia [OM representative](#) (i.e., the [occurrence reporting](#) contact) is notified immediately.
- The appropriate ES&H coordinator is notified of the event.
- Occurrences are properly investigated, analyzed, and reported.
- [Division ES&H Team](#) members are asked to participate in the process, as needed, to ensure quality



reporting.

- Reports are reviewed by a derivative classifier (DC), as appropriate.
- Reports are written for a broad audience and according to the [Occurrence Reporting Critique Checklist](#).
- Reports are submitted to Sandia's occurrence management representative for transmittal to DOE's Occurrence Reporting Process System (ORPS).
- **Lessons learned and generic or programmatic implications are identified and actions are taken to minimize or prevent recurrence.**
- Causes are identified and [corrective actions](#) are implemented (see [Section 22B](#), "Root Cause Analysis (RCA)").
- Ensure that all supporting information pertaining to occurrence reports (e.g., graphs, analyses, and formal investigation reports) is retained in accordance with the [Sandia Records Retention and Disposition Schedule](#).

Required record material includes causal analysis documentation and corrective action evidence.

- Review occurrence reports and operations information from other organizations to determine generic implications and improve operations within their own facilities (see [Section 22C](#), "Lessons learned").

Members of the Workforce shall do the following when they become aware of an event that they deem may constitute a problem, concern, failure, malfunction, or deficiency in equipment, processes, procedures, or programs, which could possibly result in an adverse effect upon DOE or contractor personnel, the public, property, the environment, or DOE's mission, security, or operations:

- Report the [event](#) to the appropriate [emergency](#) or [non-emergency](#) phone number.

Notes:

- [Chapter 15](#), "Emergency Preparedness and Management," explains the difference between emergencies and non-emergencies.
- To report an event at non-Sandia-controlled premises, follow the reporting procedures of the host site, as appropriate, and contact the Sandia occurrence management representative.

- Notify the appropriate Sandia management.
- Preserve, to the extent feasible, and document evidence of accidents (see [Attachment 18C-3](#), "Initial Accident Scene Investigation," and [Attachment 18C-4](#), " Example Investigation Hold Tag,").

Note: Some events require accident investigation by DOE (see [Attachment 18C-1](#), "Accident Investigation Criteria").

Guidance

The [Occurrence Management Reporting Criteria](#) is derived from [DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*, and automatically includes graduated thresholds known as significance categories for reporting events.

Events that **do not** fall within the thresholds specified by the reporting criteria are **not** considered reportable to DOE as an occurrence.

If no other criteria apply, the FM/D may categorize and report the event as an occurrence per reporting criteria group 10

(2), "Any event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the facility manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex." See the topic, "[Non-Occurrence Trackable Event \(NOTE\)](#)," to determine whether an event is reportable under that definition.

See the [Occurrence Management](#) website and, [Attachment 18C-2](#), "Occurrence Reporting Model," for additional information about occurrence reporting and related processes, including the required report forms and detailed information about notification and reporting timeframes.

Managers and FM/Ds should see the [occurrence reporting contact](#) for assistance with implementing occurrence management and reporting requirements.

*SUPPORTING DOE INVESTIGATIONS

Requirements

Note: Sandia FM/Ds **are not** required to perform an identical investigation when DOE is conducting Type A or B investigations of an occurrence.

FM/Ds shall provide supporting for DOE Type A and Type B investigations, including:

- Gathering information to submit to the DOE Accident Investigation Board.
- Supporting DOE during their conduct of Type A or B investigations (see [Attachment 18C-2](#), "Occurrence Reporting Model").
- Establishing and maintaining readiness to respond to accidents, mitigate the consequences, assist in collecting and preserving evidence, and assist with the conduct of the investigation, including preserving the accident scene (see "[Preserving the Accident Scene](#)") through photography and other means.
- Providing office space and equipment for the DOE Accident Investigation Board and providing general administrative assistance.
- Preparing, implementing, and tracking completion of approved corrective action plans that satisfy judgments of the need identified by the DOE Accident Investigation Boards.

*NON-OCCURRENCE TRACKABLE EVENT (NOTE)

Note: DOE M 231.1-2 *Occurrence Reporting and Processing of Operations Information*, establishes a class of events that are below the thresholds for occurrence reporting, but still must be tracked and analyzed for trends. The order calls these, "Non-reportable Events," but does not explicitly define them. For clarity, the Sandia Occurrence Management group has renamed this type of event a "[Non-Occurrence Trackable Event \(NOTE\)](#)." For further information on the NOTE reporting process, see the Occurrence Management Non-Occurrence Trackable Event (NOTE) [website](#).

Requirements

Members of the Workforce who determine that an event is a [NOTE](#) shall contact their ES&H coordinator or FM/D regarding submitting the event to the [Occurrence Management](#) function in Department 10335.

Note: The occurrence reporting template has been redesigned to accommodate the reporting of NOTES

Guidance

DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, required quarterly analysis of both occurrence reports and NOTES is performed by Occurrence Management and reviewed by members of a LIWG subteam prior to submission to DOE/NNSA/SSO. For further information on this process, see "[Performance Analysis](#)."

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Construction and construction-like work	Section 4V , "ES&H for Contracted Construction and Construction Like Activities"
Portable power tools	Section 4N , "Industrial Machine and Portable Power Tool Safety"
Electrical work	Section 4B , "Electrical Safety Practices"

*REFERENCES

Requirements Source Documents

[DOE O 225.1A](#), *Accident Investigations*.

[DOE O 231.1A](#), *Environment, Safety, and Health Reporting*.

[DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*.

Related Documents

[36 CFR 1236](#), "Management of Vital Records."

[DOE 5480.19](#), *Conduct of Operations Requirements for DOE Facilities*.

[DOE O 151.1B](#), *Comprehensive Emergency Management System*.

[DOE G 231.1-1](#), *Occurrence Reporting and Performance Analysis Guide*.

[DOE G 231.1-2](#), *Occurrence Reporting Causal Analysis Guide*.

[DOE M 231.1-1 A](#), *Environment, Safety, and Health Reporting Manual*.

[DOE O 231.1A](#), *Environment, Safety, and Health Reporting*.

[DOE-NE-STD-1004-92](#), *Root Cause Analysis Guidance Document*.

[Methodology for Performance Analysis of Occurrences & Non-occurrence Trackable Events](#).

SNL, [CPR001.3.3](#), *Formality of Operations Manual*.

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ES&H Manual

* CANCELLATION NOTICE

SECTION 10K – UNDERGROUND STORAGE TANKS

Cancellation Date: May 18, 2006

Section 10K, “Underground Storage Tanks,” was cancelled and archived May 18, 2006. The content from 10K was added to the following section.

- [Section 10F](#), “Oil and Fuel Storage.”



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ES&H Manual

SECTION 2A – PLAN WORK


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MN471001, Issue D

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Administrative Changes: September 27, 2000, May 11, 2004, August 17, 2005, and [April 23, 2007](#)

* Indicates a substantive change

- 
- [Safety Management Function](#)
 - [*Work Planning](#)
 - [Business Rules Hierarchy](#)
 - [ES&H Performance Criteria](#)
 - [*Planning Interfaces](#)
 - [*Resource Interfaces](#)
 - [References](#)
-

SAFETY MANAGEMENT FUNCTION

Guidance



Managers should be aware that "plan work":

- Is the first safety management function of Sandia's Integrated Safety Management System (ISMS) (see [CPR400.1.2](#), *Integrated Safety Management System [ISMS] Description*).

- Encompasses those "up front" processes, programs, and activities for organizing the work of any business unit, project, or activity. These include:
 - Developing and maintaining work plans to meet the mission.
 - Communicating management expectations (e.g., policies, standards, goals, performance objectives).
 - Establishing organization structure, interfaces, roles and responsibilities, authorities, and ownership.
 - Managing resources (e.g., staff, budget, prioritization process).
- Includes integrating safety into all work processes and activities.

Managers should see [CPR001.3.4](#), *The Corporate Work Process (CWP)*, for additional information.

*WORK PLANNING

Requirements

Managers or project managers, as appropriate, shall ensure that:

- Work planning is performed that defines roles and responsibilities and establishes cost, schedule, and performance requirements for work activities.
 - Budget processes that account for the life cycle (i.e., "cradle-to-grave" evolution) of the work are developed and used (see [CPR500.1.1](#), *Financial Manual*, for more information).
-

BUSINESS RULES HIERARCHY

Guidance



Managers should be aware that Sandia's corporate policy business model establishes the structure by which the following are defined and communicated:

- Corporate policies
- Values
- Principles
- Major processes for managing SNL

See the [Business Rules Home Page](#) for additional information on policies and processes that fit into this framework. Also refer to any requirements established by the applicable Strategic Business Unit (SBU) or Strategic Management Unit (SMU) for the work.



ES&H PERFORMANCE CRITERIA

ES&H Performance Objectives

Guidance

Managers should develop ES&H program-, project-, division-, center-, facility-, and activity-level performance objectives, as appropriate, in relation to Sandia's Corporate Goals and Milestones.

Requirements and Standards Identification

Guidance

Managers should be aware that:

- [DE-AC04-94AL85000](#), *M&O Contract Between Sandia Corporation and DOE*, lists "baseline directives" applicable to Sandia in Section J, Appendix J. Baseline directives management refers to the corporate-level process by which DOE directives are tailored into the prime contract (see [CPR200.2.2](#), *Baseline*

Directives Management, for additional information).

- Implementation of programmatic level and operational level requirements involves the development of implementation plans at both levels. The formality of these plans depends upon the formality of the requirements (see [CPR400.1.2.2](#), *Process for Flow-Down and Tailoring of Requirements and Standards That Support Sandia's Integrated Safety Management System*, for additional information).

Hazards Identification

Guidance

Managers should consider the hazards associated with work as part of the decision to undertake that work.

*PLANNING INTERFACES

This section identifies interface considerations for work planning identified through lessons learned.

Programs, Organizations, and Space

Guidance

Members of the Workforce should see [Section 1D](#), "Who Does What," and [Attachment 1D-2](#) (summary chart) for information about responsibilities for all Members of the Workforce in their various program-, organization-, and space-related ES&H roles.

Matrixed Operations

Guidance

Managers should be aware that work assignments involving personnel matrixed across organizational lines or shared use of space may necessitate special clarification and/or negotiation of roles and responsibilities between the organizations involved in the work

and supporting organizations.

National Environmental Policy Act (NEPA)

Guidance

For information on compliance with the NEPA, see [Section 10B](#), "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties."

Facility Management

Guidance

Managers should:

- Consider how facilities systems impact their operations in terms of safety and programmatic support.
- Consult their [building manager](#) at SNL/NM or facility support contact at other sites to negotiate and schedule the development of an internal lease agreement (ILA), where appropriate, and to obtain the following "landlord" services:
 - Building and site maintenance
 - Basic site utilities
 - Building mechanical and electrical systems (up to the point-of-user connection)
 - Other services as negotiated

See [CPR400.4.2](#), *Space and Land Management Manual*, for more information.

Packaging and Transportation

Requirements

Members of the Workforce who need onsite or offsite transportation of hazardous

material shall comply with requirements in [Chapter 12](#), "Packaging and Transportation of Hazardous Material."

*RESOURCE INTERFACES

Resource Allocation

Requirements

Managers shall incorporate necessary ES&H requirements and support resources into work plans and budgeting the same as with any other work element.

Contracting and Procurement

Requirements

Managers shall:

- Work with their Sandia contracting representative (SCR) to specify job-specific ES&H requirements in purchase requisitions and requests for quotations (RFQs).
- Assign a Sandia delegated representative (SDR) for all contracted work that they manage.
- Develop a statement of work (SOW) that specifies job-specific requirements.
- Identify ES&H training requirements and responsibilities for contracted work (see [Contractor Training Instructional Aid](#) and [Chapter 11](#), "ES&H Training").

Note: See CPR500.2.1, *Procurement Manual*, for more information. [Section 5.2](#), "Sandia Delegated Representative (SDR): Roles And Responsibilities," discuss the responsibilities of Sandia delegated representatives (SDRs).

Guidance

Managers should be aware that:

- Special work permits are required for certain kinds of activity (consult the appropriate [Division ES&H Team](#) for guidance on when permits are required and how to obtain them). For more information on work permit requirements, see [Chapter 21](#), "Technical Work Documents (TWDs)."
- Directing contract work may be the responsibility of a contractor ("[contractor-directed contracts](#)") or an SNL employee ("[Sandia-directed contracts](#)").
- Procurement of services, material, or equipment may require special notification or approvals (see CPR500.1.2, *Procurement Manual*, [Section 3.1.2.5](#), "Special Handling and Notification Copies," for additional information). Some examples are:
 - Environmentally-sensitive equipment (e.g., oil-filled generators).
 - Sensitive chemicals (i.e., controlled substances and their chemical precursors).
 - Construction or other work that affects an internal lease agreement (ILA).
 - Radiological material and equipment (see [CPR400.1.1.32/MN471016](#), *Radiological Protection Procedures Manual*, for additional information).
 - Fire protection equipment, including detection and suppression systems.

Union Workers

Guidance

Managers at SNL/NM should:

- Be aware that some activities (e.g., moving equipment) must be performed by bargaining unit members (i.e., represented personnel).
- Consider getting union representatives involved in work planning when appropriate (consult the [labor relations](#) contact for guidance).

Space and Site Services

Guidance

Members of the Workforce should consult their building manager at SNL/NM or [facilities support](#) contact at other sites for all space and site service requests involving the following types of line support services:

- Space and site planning
- Facility project development
- Facility modifications
- Facility engineering and design
- Facility drawings and standards
- Construction management and inspection
- [Asbestos](#) abatement
- Building systems operations and maintenance
- Custodial services

REFERENCES

Requirements Source Documents

SNL, [DE-AC04-94AL85000](#), *M&O Contract Between Sandia Corporation and DOE.*

Implementing Documents

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description.*

SNL, [CPR400.1.2.2](#), *Process for Flow-Down and Tailoring of Requirements and Standards That Support Sandia's Integrated Safety Management System.*

Related Documents

 [DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*

SNL, [Annual DOE/SNL Appraisal Process.](#)

SNL, [CPR001.3.4](#), *The Corporate Work Process (CWP).*

SNL, [CPR200.2.2](#), *Baseline Directive Management.*

SNL, [CPR400.4.2](#), *Space and Land Management Manual.*

SNL, [CPR500.1.1](#), *Financial Manual.*

SNL, [CPR500.2.1](#), *Procurement Manual.*

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ES&H Manual

SECTION 6W - PROCESS SAFETY MANAGEMENT (PSM)

Subject Matter Expert: [Kathleen Moore](#); CA Counterpart: [Mark Brynildson](#)

MN471001, Issue A

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* Indicates a substantive change

- [Applicability](#)
 - [*Process Safety Management \(PSM\) Standard](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to **all Members of the Workforce whose activities include any [process](#)** that involves:

- [Highly hazardous chemicals](#).
- [Flammable liquids or gases](#).

This section does **not** apply to [normally unoccupied remote facilities](#).



*PROCESS SAFETY MANAGEMENT (PSM) STANDARD

Requirements

Managers shall be responsible for consulting the appropriate [Division ES&H Team](#) for assistance in complying with the PSM Standard, when a process exceeds the following limits [onsite](#), in one location:

- [Highly hazardous chemicals](#) that are at or above the threshold quantity limits specified in the Chemical Information System (CIS), [Chemical Inventory - OSHA-PSM Chemical List](#).
- [Flammable liquids or gases](#) in quantities of 10,000 pounds or more.



Note: One location could be identified as an entire building, several contiguous or separate laboratories, a single laboratory, etc., depending upon the potential release scenarios. Consult the [process safety contact](#) for additional information and guidance.

Guidance

Members of the Workforce may search the OSHA Process Safety Management (PSM) Report on the [CIS webpage](#) to aid in determining when quantities of [highly hazardous chemicals](#) may exceed threshold quantity limits.



RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to the Process Safety Management (PSM) include:

Hazard/Activity	Reference
Explosives	Chapter 9 , "Explosives Safety."
Flammable liquids	Chapter 5 , "Fire Protection."
Highly hazardous chemicals	Section 6D , "Hazard Communication Standard." Section 6E , "Laboratory Standard - Chemical Hygiene Plan." Section 6U , "Hazardous Material (Chemical and Biological) Inventory"

*REFERENCES

Requirements Source Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees.*

[DOE 5480.4](#), *Environmental Protection, Safety, and Health Protection Standards.*

[29 CFR 1910.119](#), *Process Safety Management of Highly Hazardous Chemicals.*

Related Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program.*

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program.*

SNL, [PG470218](#), *Worker Protection Program (WPP).*

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ES&H Manual

*SECTION 19B – RADIOACTIVE WASTE MANAGEMENT

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*Indicates a substantive change

- [*Applicability](#)
- [*Training](#)
- [*Waste Minimization](#)
- [*Planning and Preparation](#)
- [*Waste Characterization - Process Knowledge](#)
- [*Wastes With No Disposal Path](#)
- [*Radioactive Waste Accumulation Area](#)
- [*Waste Containers, Labeling, and Packaging](#)
- [*Segregation and Control of Radioactive Waste](#)
- [*Waste Characterization - Sampling and Analysis](#)
- [*Processing of Material or Treatment of Radioactive Waste](#)
- [*Disposal Request for Pickup of Radioactive Waste](#)
- [*Certification of Radioactive Waste](#)
- [*Nonconformances](#)
- [*Related Hazards and Activities](#)
- [*References](#)
- *Attachments
 - [*19B-1](#)- Release of Non-Radioactive Waste
 - [19B-2](#)- Approval Request Process for Radioactive Waste With No Disposal Path

- [19B-3](#) - Samples of Radioactive Waste Labels and Tags
- [19B-4](#)- Illustration of Waste Parcel
- [19B-5](#)- Example NTS Allowable Items List
- [19B-6](#)- NTSWAC General Waste Form Criteria
- *Forms
 - [SF 2042-NCA](#), SNL Nonconformance Corrective Action Report Form
 - *[SF 2042-NCI](#), [SNL NTS Non-Conforming Items](#)
 - [SF 2042-PKE](#), SNL Process Knowledge Evaluation Form
 - SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([Website](#))
 - [SF 2042-TRS](#), NTS Allowable Items



*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to Members of the Workforce:

- - Who are involved in activities on [Sandia-controlled premises](#) that generate [radioactive waste](#) that must be managed through the SNL/NM waste management system.
 - Who perform activities at other sites (e.g., military bases) that generate radioactive waste that is returned to SNL/NM for management through the SNL/NM waste management system.

For purposes of this document, DOE and NNSA are synonymous.

Exemptions





This section does **not** apply to:

- Radioactive material or radiation-generating devices that are undergoing testing or evaluation, or that still have a defined use and are kept in good working condition. As such, these items are not yet waste.
- Solid wastes that meet the criteria in [Attachment 19B-1](#), "Release of Non-Radioactive Waste."
- Solid wastes that meet the criteria in [Attachment 19B-1](#), "Release of Non-Radioactive Waste."

Note: The exemptions for naturally occurring radioactive materials (NORM) and for consumer products, as discussed in Attachment 19B-1, "Release of Non-Radioactive Waste," do not apply to SNL/CA.

*TRAINING

Work Activity or Role	Required	Recommended
Primary waste generator (NM)	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once), * ENV252 (every 2 years)	N/A
Waste custodian (NM)	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once), ENV252 (every 2 years)	N/A
Secondary waste generator (NM)	(See requirements and guidance sections below this table.)	ENV112 (annually), RAD210 or RAD230 (every 2 years), ENV189 (once)

 <u>Primary waste generator (CA)</u>	<u>ENV112CA</u> (annually), <u>RAD210</u> or <u>RAD230</u> (every 2 years), <u>ENV189 CA</u> (once), <u>ENV252</u> (every 2 years)	
<u>Waste custodian (CA)</u>	<u>ENV112 CA</u> (annually), <u>RAD210</u> or <u>RAD230</u> (every 2 years), <u>ENV189 CA</u> (every 2 years)	
<u>Secondary waste generator (CA)</u>	(See requirements and guidance sections below this table.)	<u>ENV112CA</u> (annually), <u>RAD210</u> or <u>RAD230</u> (every 2 years), <u>ENV189 CA</u> (once)
ES&H coordinator and environmental protection representative involved with radioactive waste (NM)	N/A	<u>ENV112</u> (annually), <u>RAD210</u> or <u>RAD230</u> (every 2 years), <u>ENV189</u> (once)
 Project leaders involved with radioactive waste (NM)	N/A	<u>ENV112</u> (annually), <u>RAD210</u> or <u>RAD230</u> (every 2 years), <u>ENV189</u> (once)
*ENV252 is a refresher of ENV189 that is required every 2 years.		

Requirements

Primary waste generators shall **train** secondary waste generators on waste management requirements that are applicable to their project(s) and document this training in organizational files.

Guidance

Primary waste generators are encouraged to provide and document periodic **training** to secondary waste generators regarding waste management requirements and issues.

*WASTE MINIMIZATION

Note: Sandia follows a waste **minimization** hierarchy:

- Material should be reduced or eliminated at the source.
- If material cannot be reduced or eliminated at the source, material should be reused or recycled.
- If material cannot be reduced or eliminated at the source, reused, or recycled, then contact the appropriate [Division ES&H Team](#) environmental protection representative for additional information on waste minimization **and waste management**.



Requirements

Primary waste generators shall:

- Integrate methods into their daily work operations to minimize the generation of radioactive waste.
- Evaluate the following activities to minimize waste:
 - Minimize material use. Consider processes or material modifications that could eliminate or reduce the generation of waste. These changes can often be justified when the cost of waste management and disposal is considered for the life of the project or process.
 - Limit the introduction and use of other material in radioactive waste-generating processes and in RMMAs.
 - Minimize the likelihood of other material contacting or mixing with radioactive material, including NORM.
 - Decontaminate material and equipment.
- Document waste minimization efforts.



Guidance

Primary waste generators should consult the appropriate [Division ES&H Team](#) environmental protection representative or the [Pollution Prevention Program contact](#) for ideas about methods of minimizing [radioactive waste](#) generation in specific processes and for information on [pollution prevention opportunity assessments \(PPOAs\)](#).

*PLANNING AND PREPARATION

*Requirements

[Primary waste generators](#) shall plan and manage [radioactive waste](#) in accordance with [PG470228](#), *SNL Radioactive Waste Management Basis*, as follows:

- Prepare a [technical work document \(TWD\)](#) that [addresses how radioactive waste will be managed](#). For additional information, see [Chapter 21](#), "Technical Work Documents (TWDs)," and CPR400.1.1.32,/MN471016, Radiological Protection Procedures Manual, [Chapter 1](#), "Radiological Work Planning and Controls."
- Ensure that the TWD addresses the following at a minimum:
 - Waste characterization, including process knowledge information, and sampling and analysis planning, as applicable.
 - Establishment of a radioactive material management area ([RMMA](#)) to control activities or processes for which a reasonable potential exists of causing radioactive contamination or activation of material that may become waste. See [Section 19D](#), "Radioactive Material Management Areas (RMMAs)."
 - Radioactive waste accumulation area.
 - Waste containers, labeling, and packaging.
 - Segregation and control of radioactive waste to maintain waste [traceability](#).
 - Preferred disposal site option.

- Reference Section 19B, “Radioactive Waste Management,” in the TWD and state that the requirements in Section 19B of the *ES&H Manual* shall be followed.
- Meet any other applicable packaging and labeling requirements described in the Nevada Test Site Waste Acceptance Criteria (NTSWAC) for disposal of low-level waste at the Nevada Test Site (NTS) or in SNL/NM plans (e.g., POL 95-01, Programmatic Waste Acceptance Criteria [WAC]) and procedures for an onsite storage facility.

Note: Consult the [waste certification official](#) for assistance in determining other applicable requirements including local DOE oversight office requirements at SNL remote sites.

- If [transuranic waste](#) will be generated, consult the [transuranic waste management contact](#) before waste is generated, to determine requirements regarding packaging, venting, and prohibited items.

Guidance

Primary waste generators should:

- Consult the appropriate [Division ES&H Team](#) environmental protection representative before waste is generated, to resolve questions regarding [radioactive waste planning](#), accumulation, packaging, segregation, control, and disposal pathway.

*WASTE CHARACTERIZATION - PROCESS KNOWLEDGE

*Requirements

[Primary waste generators](#) shall:

- Characterize radioactive waste to permit proper segregation, treatment, storage, and disposal.

- Ensure that physical, chemical, and radiological characteristics of the radioactive waste are documented.
- Document process knowledge for the radioactive waste as the first step in waste characterization.

Note: Contact the appropriate [Division ES&H Team](#) environmental protection representative or the [waste characterization team leader](#) for assistance in documenting process knowledge. The waste characterization team leader can provide assistance on whether SF 2042-PKE, SNL Process Knowledge Evaluation Form, shall be completed by the primary waste generator. If the [low-level waste](#) meets the waste description in an existing SF-2042-PKE form for miscellaneous lab trash, the SF-2042-PKE, SNL Process Knowledge Evaluation Form ([Word file/ Acrobat File](#)), will not need to be completed by the primary waste generator for this waste. **Document radioactive waste characterization information in a memo if an SF 2042-PKE form is not required.**

Note: When process knowledge relies on living memory, the individual's knowledge shall be documented and signed by both the interviewer and the interviewee. For telephone interviews, a statement outlining relevant information shall be signed by the interviewer (and interviewee if possible).

- Provide waste characterization information as an attachment to SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([website](#)).
- Ensure that radioactive waste characterization information includes:
 - Determination that the radioactive waste is **not** regulated by the Resource Conservation and Recovery Act (RCRA) or by state regulations as a [mixed waste](#).
 - Determination that the radioactive waste does **not** contain other prohibited items (see "Segregation and Control of Radioactive Waste").
 - An estimate of the activity of each radionuclide contaminant in each [waste parcel](#), based on process knowledge and/or sampling and analysis.

Note: The waste characterization project leader has provided a waste

characterization [website](#) for use by generators of radioactive waste.

- Manage unknown waste for which there is no characterization information as mixed waste (see [Section 19C](#), "Mixed Waste Management"), unless process knowledge and/or sampling and analysis can verify that the waste does **not** contain RCRA-regulated hazardous waste, state-regulated hazardous waste, or radioactive waste.

Note: Contact the appropriate Division ES&H Team environmental protection representative for assistance in managing unknown waste. Contact the waste characterization project leader for assistance in characterizing unknown waste.

- Assist the [radioactive and mixed waste operations](#) contact in determining a packaging option for the radioactive waste, if the radioactive waste generated is remote-handled waste that has a dose equivalent rate greater than 200 mrem/hr at the surface of the unshielded waste container.

If a generator organization has completed SF 2042-PKE, SNL Process Knowledge Evaluation Form ([Word file](#)), for [low-level waste](#), the manager of the generator organization shall:

- Designate a [waste custodian](#) to assist in managing the waste.
- Ensure that the waste custodian is not the primary waste generator.

Guidance

[Primary waste generators](#) should consider the following in obtaining sufficient process knowledge to identify Resource Conservation and Recovery Act (RCRA)-regulated or state-regulated [hazardous waste](#) in the [mixed waste](#), and to estimate the activity of each radionuclide contaminant in each [waste parcel](#).

Process knowledge is a characterization technique that relies on the generator's knowledge of the physical, chemical, and radiological properties of the materials associated with waste-generation processes, and/or mixed waste items. It includes knowledge of the fate of those materials during and after the process, and the associated [administrative controls](#).

Process knowledge sources include but are not limited to the following programmatic and waste-stream-specific components:

- Historic records, including historic analytical data.
- Facility maps delineating waste-generation areas.
- Descriptions of waste-generating operations.
- System descriptions.
- Plans and drawings.
- Areas and/or buildings where each [waste stream](#) is generated.
- Material inputs, including material safety data sheets (MSDSs).
- Manufacturing specifications.
- Mass balance documentation.
- Literature searches.
- Living memory (documented interviews).
- Laboratory notebooks and project reports.
- Process logs and batch records.
- Procedures.

*WASTES WITH NO DISPOSAL PATH

*Requirements

Note: Additional information and assistance regarding wastes with no disposal path (NDP) can be provided by the [NDP waste contact](#). See [Attachment 19B-2](#), “Approval

Request Process for Waste with No Disposal Path.”

[Primary waste generators](#) shall:

- Identify NDP waste by describing the type and quantities of waste likely to be generated from a new project or process.
- If NDP waste is identified, complete an approval request package in consultation with the [NDP waste contact](#).
- In accordance with [Attachment 19B-2](#), “Approval Request Process for Waste with no Disposal Path,” request approval from DOE in advance to generate any NDP waste, with assistance from the [NDP waste contact](#).
- Review and resubmit the request package for approval each year the waste is generated, unless a disposal path becomes available.

*RADIOACTIVE WASTE ACCUMULATION AREA

*Requirements

[Primary waste generators](#) shall determine appropriate locations for radioactive waste accumulation areas.

Primary waste generators shall ensure that areas used for [radioactive waste](#) accumulation:

- Meet the requirements for radiological work permits specified in CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, [Chapter 1](#), “Radiological Work Planning and Controls.”
- Are identified by appropriate radiation protection signs, which are posted clearly and conspicuously. See CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, [Chapter 2](#), “Posting and Labeling for Radiological Control.” Consult the appropriate [Division ES&H Team](#) radiation protection representative for assistance.

- Meet applicable RMMA requirements as described in [Section 19D](#), "Radioactive Material Management Areas (RMMAs)." [Consult the RMMA contact for assistance.](#)
- Are near the point of generation that is under the control of a primary waste generator or at an accumulation area that is under the control of a [waste custodian](#) or their delegated alternate.
- Are separated from areas with non-waste material.
- Have adequate aisle space around waste containers so that emergency access is preserved (see [Chapter 5](#), "Fire Protection").
- Provide [secondary containment](#) for radioactive waste containers that contain any free liquid and that are outside, inside near a floor drain, or inside where the possibility exists that spilled liquid could be discharged to a sanitary sewer or to the environment. Secondary containment systems shall have:
 - Sufficient capacity to contain 10% of the total volume of the containers, or the volume of the largest container, whichever is greater.
 - A base that is sufficiently impervious to contain leaks, spills, and precipitation until the accumulated material is removed.
 - A sloped base, elevated shelves, or other design features that prevent the containers from coming into contact with spilled or accumulated liquids.

Primary waste generators shall, in the event of a spill or release of any radioactive waste:

- Immediately implement the applicable emergency plan. See [Chapter 15](#), "Emergency Preparedness and Management," for specific requirements.
- Comply with [Section 10E](#), "Chemical Spills," and CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, [Chapter 11](#), "Radiological Incidents."
- Consult the appropriate [Division ES&H Team](#) for assistance in complying with [Section 18E](#), "Environmental Release Reporting," and [Section 19D](#), "Radioactive Material Management Areas (RMMAs)."

Note: A spill or release of radioactive waste may require designation of the spill area as an RMMA.

Guidance

Primary waste generators should:

- Consult the appropriate [Division ES&H Team](#) environmental protection representative for assistance in establishing appropriate radioactive waste accumulation areas.
- Conduct periodic inspections of radioactive waste-generating processes and accumulation areas using an inspection form or notes, and retain inspection forms or notes in a project file. Consult the appropriate Division ES&H Team environmental protection representative for assistance in completing the inspection. The inspections should, at a minimum, check that the waste containers are labeled appropriately, the waste containers are in good condition and are closed, and that there are no leaks or spills.
- Ensure that secondary containment systems are designed with additional capacity to contain the volume of fire protection sprinkler water that would be discharged during 20 minutes of flow. Consult the [fire protection contact](#) for assistance in determining the sufficient capacity of secondary containment.

*WASTE CONTAINERS, LABELING, AND PACKAGING

*Requirements

[Members of the Workforce](#) shall **not** dispose of labels used to indicate [radioactive waste](#) in normal office trash unless the words "Caution," "Radiation," "Radioactive Material," "Tritium Waste," as applicable, and the trefoil have been removed or obliterated (see [Attachment 19B-3](#), "Samples of Radioactive Waste Labels and Tags").

If [transuranic waste](#) will be generated, the [primary waste](#) generator shall consult the

[transuranic waste management contact](#) for additional requirements regarding packaging and venting of containers.

Primary waste generators shall implement the following steps when labeling and packaging containers of solid radioactive waste:

Solid Radioactive Waste

Step	Action
1	<p>Obtain the following, as appropriate:</p> <ul style="list-style-type: none"> ● A waste accumulation container (such as a plastic bag). If plastic bags are used, they shall be clear or light yellow to allow visual inspection of contents through a double-bagged waste parcel. ● An SNL/NM-certified shipping container, liner, and absorbent. SNL/NM-certified shipping containers include: <ul style="list-style-type: none"> ○ 30-gallon metal drums ○ 55-gallon metal drums ○ 85-gallon metal drums ○ 7x4x2-ft. metal boxes ○ 7x4x4-ft. metal boxes ○ transportainers. <p>Note: Consult the radioactive and mixed waste operations contact to determine the appropriate waste accumulation container or SNL/NM-certified shipping container for the waste.</p> <ul style="list-style-type: none"> ● Obtain SNL/NM-certified shipping containers, liners and absorbent through the radioactive and mixed waste operations contact. ● Certification of existing shipping containers, as necessary. ● Labels and forms.

- Container-handling equipment.

2

Perform the following, as applicable:

- Verify that a SNL/NM-certified liner is in drums and boxes.
- Ensure that any lead used for shielding is not radioactively-contaminated when introduced if shielding is required for an elevated radiation exposure.

3

Perform the following before use:

- Confirm that shipping containers are SNL/NM-certified by:
 - Verifying that the containers have a bar-coded SNL/NM container number (such as SNL/NM004444).
 - Responding on an SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form ([Website](#)).
- Conduct a pre-use inspection of waste containers and liners immediately before placing waste in the containers. The inspection includes:
 - Verifying that containers and liners are in good condition and leak-free (i.e., have no tears, dents, creases, bulges, or corrosion that would compromise the integrity of the container). Minor dents or minor surface corrosion are acceptable.
 - Visually evaluating container integrity and verifying that there is no liquid in the container before it is used.
 - Documenting this pre-use inspection by responding on an SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form.

Note : If a nonconforming item has been received from

the RWNMDD or from a RWNMDD-approved vendor, consult the [radioactive and mixed waste operations](#) contact.

- Contact the [waste certification official](#) if water is found in a container, or if the integrity of a container has been compromised.

4

Perform the following immediately after waste is placed into the waste parcel:

Note: [Attachment 19B-4](#), "Illustration of Waste Parcel," shows that when radioactive waste is placed into a labeled waste container it is defined as a [waste parcel](#).

- Affix a "Caution Radioactive Material" warning label (see [Attachment 19C-3](#), "Samples of Mixed Waste Labels and Tags") or "Danger, Radioactive Material" warning label (see CPR400.1.1.32/ MN471016, *Radiological Protection Procedures Manual*, Chapter 2, "Posting and Labeling for Radiological Control"). Consult the appropriate [Division ES&H Team](#) radiation protection representative for assistance on which label to use.
- Consult the appropriate Division ES&H Team radiation protection representative to determine whether a radiological survey is required during accumulation. Also determine whether a "Caution Radioactive Material" information tag or a "Caution Radioactive Material" information label is required during accumulation (see [Attachment 19B-3](#), "Samples of Radioactive Waste Labels and Tags").
- Fill in the appropriate information on the information tag or label, if it is required to be attached to the waste [parcel](#).
- Attach a "Caution Tritium Waste" warning label (see [Attachment 19B-3](#), "Samples of Radioactive Waste Labels and Tags") if more than one millicurie of tritium is determined to be present in the waste.
- Record the start date (the date that radioactive waste is first placed

in the waste **parcel**) on the waste **parcel**.

- Assign a tracking number to the waste parcel if it does not already have an SNL/NM number.

5

When segregating and placing radioactive waste into a waste parcel, do the following:

- Add absorbent to waste parcels, if there is potential for condensation or moisture. Example waste parcels include waste excavated from the ground, or potentially damp personal protective equipment, such as Tyvek coveralls. Consult the [radioactive and mixed waste operations](#) contact to obtain absorbent, and for assistance on how much absorbent to use.
- Keep the waste parcel closed at all times, except when waste is being added or removed.
- **Load waste containers efficiently to minimize void space.**
- Ensure that the gross weight of the waste container and waste does **not** exceed the maximum allowable gross weight, as stamped on the waste container or according to DOT regulations. Consult the radioactive and mixed waste operations contact for assistance with this determination.
- Wrap and seal the waste item in plastic, if it is too large to containerize. Contact the radioactive and mixed waste operations contact for assistance.

6 Double-contain parcels of solid radioactive waste to prepare for pickup by the **Regulated Waste/Nuclear Material Disposition Department (RWNMDD)**:

- Double containment can be done in a number of **the following ways**:
 - **Place** compactable waste, such as Tyvek coveralls or latex gloves, **in a translucent**, labeled plastic bag, and double-bag **the waste parcel** once full.
 - Place a liner in a drum before use.
 - **Place** radioactive waste metal debris in a lined, labeled, SNL/ NM-certified metal drum or metal box. Ensure that **sharps** are well taped or boxed before they are double-contained.

Note: Consult the appropriate Division ES&H Team environmental protection representative or the **radioactive and mixed waste operations** contact for assistance in determining appropriate packaging for radioactive waste.

- Ensure that the outer container is labeled appropriately for waste parcels, as described in **Step 4**.

7 Request a radiological survey by the Division ES&H Team radiation protection representative to facilitate release of the waste parcel **when the waste parcel is full and double-contained** (see CPR400.1.1.32/ MN471016, Radiological Protection Procedures Manual, **Chapter 8**, "Monitoring Areas and Material").

Consult the appropriate Division ES&H Team radiation protection representative for assistance in completing a "Caution Radioactive Material" information tag or a "Caution Radioactive Material" information label to be placed on the waste parcel (see Attachment 19B-3, "Samples of Radioactive Waste Labels and Tags").

Primary waste generators shall implement the following steps when managing and labeling containers of liquid radioactive waste:

Liquid Radioactive Waste

Step	Action
1	<p>Collect liquid radioactive waste in an appropriate rigid container (plastic, glass, or metal) that has a screw-cap lid, such as a carboy, or collect it in an approved drum. Before the container is used:</p> <ul style="list-style-type: none"> ● Consult the radioactive and mixed waste operations contact for assistance on the appropriate container for the liquid waste or waste water. ● Ensure that the container is compatible with the liquid waste. ● Visually evaluate container integrity and respond appropriately on SF 2042-TRA, SNL/NM, Radioactive or Mixed Waste Disposal Request Form (Website). <p>Note: Keep the waste container closed at all times, except when waste is being added or removed.</p> <p>Note: Always allow adequate headspace in a container of liquid waste such that pressure buildup will not cause leakage from the container. Fill the container no more than 50% full, if solidification will be a required treatment.</p>
2	<p>Perform the following immediately after liquid radioactive waste is placed in the waste parcel:</p> <ul style="list-style-type: none"> ● Affix a "Caution Radioactive Material" warning label (see Attachment 19C-3, "Samples of Mixed Waste Labels and Tags") or "Danger, Radioactive Material" warning label (see CPR400.1.1.32/ MN471016, <i>Radiological Protection Procedures Manual</i>, Chapter 2, "Posting and Labeling for Radiological Control"). Consult the appropriate Division ES&H Team radiation protection representative for assistance on which label to use. ● Consult the appropriate Division ES&H Team radiation protection representative to determine whether a radiological survey is required during accumulation. Also, determine whether a "Caution Radioactive Material" information tag or, "Caution Radioactive

Material" information label is required **during accumulation** (see [Attachment 19B-3](#), "Samples of Radioactive Waste Labels and Tags").

- Fill in the appropriate information on the information tag or label, if it is required to be attached to the waste **parcel**.
- Affix a "Caution Tritium Waste" warning label (see [Attachment 19B-3](#), "Samples of Radioactive Waste Labels and Tags") to the waste parcel if more than one millicurie of tritium is determined to be present in the waste.
- Record the start date (the date that radioactive waste is first placed in the **parcel**) on the waste **parcel**.
- **Record** a tracking number **on** the waste parcel.

3 Control the liquid waste **parcel** in a radioactive waste accumulation area with secondary containment, as described under the topic, "[Radioactive Waste Accumulation Area](#)."

4 Ensure that the gross weight of the waste **parcel** does **not** exceed the maximum allowable gross weight, as stamped on the container or according to DOT regulations. Consult the [radioactive and mixed waste operations](#) contact for assistance with this determination.

5 To prepare the liquid waste parcel for pickup, place it into a secondary bag, unless the container is a carboy, a **sealable** can, or a drum. If the liquid waste accumulation container is glass, pack it into a bucket with vermiculite or other appropriate material that will hold the liquid container upright.

6 Label and tag the secondary bag or bucket appropriately, as described in [Step 2](#).

7 Request a radiological survey by the Division ES&H Team radiation protection representative to facilitate release of the waste parcel **when the waste parcel is full** (see CPR400.1.1.32/MN471016, Radiological Protection Procedures Manual, [Chapter 8](#), "Monitoring Areas and Material").

Consult the appropriate Division ES&H Team radiation protection representative for assistance in completing a "Caution Radioactive Material" information tag or a "Caution Radioactive Material" information label to be placed on the waste parcel (see [Attachment 19B-3](#), "Samples of Radioactive Waste Labels and Tags").



Guidance

[Primary waste generators](#) should:

- Obtain labels and tags from **Just in Time (JIT)**, the appropriate [Division ES&H Team](#), the [radioactive and mixed waste operations](#) contact, or the [waste certification official](#).
- Place labels in the upper left corner of a **7x4x4-foot** box, or on the upper one-third of a 55-gallon drum.
- Use permanent or indelible ink to complete container labels.
- Accumulate radioactive waste parcels indoors and not in an accumulation area located outdoors.
- Check labels periodically to ensure continued legibility.

Note: The labeling system described above does **not** apply to waste containers that are generated by the **Environmental Restoration (ER)** program. The ER program has developed a labeling system that is specific to its operations, which is not described here.

*SEGREGATION AND CONTROL OF



RADIOACTIVE WASTE

Requirements

Note: Proper segregation and control of [radioactive waste](#) is required to meet disposal site [waste acceptance criteria](#). Lack of appropriate segregation could severely impact SNL waste disposal options. Consult the appropriate [waste certification official](#) for assistance.

Note: For SNL/NM, see [Section 19A](#), “Planning and Preparation – Waste Identification,” for additional information on segregation of potential RCRA-regulated waste. For SNL/CA, see CPR400.1.1/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*, for additional information on segregation and characterization of potential RCRA-regulated and state-regulated waste.




[Primary waste generators](#) shall:

- Segregate radioactive waste by physical form into separate [waste parcels](#) (for example, metal debris, soil, filters, liquid, or compactable waste).


Note: See SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form, for categories of physical forms.

- Segregate classified material from radioactive waste.
- [Segregate accountable material from radioactive waste.](#)
- Ensure that the following prohibited items **are not** present in [low-level waste](#) to be disposed at the Nevada Test Site (NTS):
 - [Transuranic waste](#).
 - Commercial greater-than-class-C radioactive waste.
 - [Hazardous waste](#) regulated under RCRA or state-of-generation (California or New Mexico) regulations.
 - [Explosives](#).

- 
- Polychlorinated biphenyls (**PCBs**) **that do not** meet the standards under 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, Subpart D, “Storage and Disposal” [[40 CFR 761.50\(b\)\(7\)](#)] for disposal in landfills (see [Section 10D](#), “Polychlorinated Biphenyl (PCB) Management,” for additional information).
 - **Compressed** gases (unpunctured aerosol cans included).
 - Etiologic agents (such as pathogens or infectious waste).
 - **Animal carcasses that are preserved in formaldehyde.**

Note: If the waste types listed above are radioactively contaminated, consult the [waste certification official](#) for assistance with managing them. See [Attachment 19B-6](#), “NTSWAC General Waste Form Criteria,” for more information on NTS requirements related to these prohibited items.

- Ensure that the following **special** items are segregated, packaged, labeled, **and/or treated** appropriately when present in low-level waste to be disposed at the NTS:

- 
- **Free liquids.**
 - Particulates less than 200 micrometers in diameter shall be packaged appropriately in 6-mil liners or immobilized.
 - Beryllium greater than 0.1% that **may** be released as an airborne particulate shall be packaged and labeled appropriately in sealed, impermeable 6-mil bags or containers.

Note: See [Section 19A](#), “Hazardous Waste Management,” under the topic, “[Beryllium-Contaminated Waste](#),” for a sample beryllium waste label.

Note: For SNL/CA, beryllium-contaminated low-level waste is regulated as mixed waste. For additional requirements regarding management and labeling, see Section 19C and CPR400.1.1/ GN470075, *Guidelines for Hazardous Waste Generators at SNL/CA*.

- 
- Sealed sources that have an activity of 100 microcuries or greater shall be

segregated from other waste.

- Asbestiform low-level waste that contains friable asbestos shall be packaged, marked, and labeled in accordance with applicable requirements.

Note: See [Attachment 19B-3](#), “Samples of Radioactive Waste Labels and Tags,” for a sample friable asbestos waste label.

Note: For SNL/CA, asbestiform low-level waste is regulated as mixed waste. For additional requirements regarding management and labeling, see Section 19C and CPR400.1.1/GN470075, *Guidelines for Hazardous Waste Generators at SNL/CA*.

- Pyrophorics.
- Chelating agents (greater than 1% by weight).
- Animal carcasses containing radioactive materials shall be packaged appropriately.
- Polychlorinated biphenyls ([PCBs](#)) that meet the standards under 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, Subpart D, “Storage and Disposal” [[40 CFR 761.50\(b\)\(7\)](#)] for disposal in landfills.

Note: Primary waste generators should contact the [waste certification official](#) for assistance on how to manage the above-listed wastes properly when they are radioactively contaminated. See [Attachment 19B-6](#), “NTSWAC General Waste Form Criteria,” for more information on NTS requirements for segregation, packaging, labeling and **treatment** of these wastes.

- If it **cannot** be recycled, segregate radioactively-contaminated brass and radioactively-contaminated electronics. Manage these wastes as mixed waste (see [Section 19C](#), “Mixed Waste Management”), unless characterization is completed to prove the waste is **not RCRA regulated or state regulated**.
- Document [waste](#) items placed into a waste parcel, as applicable, using the Generator Waste Accumulation Disposal Log form (found in SF 2042-TRA, SNL

Radioactive or Mixed Waste Disposal Request Form), or an equivalent form.



Note: The Generator Waste Accumulation Disposal Log form is for heterogeneous waste, such as metal debris. The Generator Waste Accumulation Disposal Log form is not required if the waste in the waste parcel is a homogeneous waste, such as soil from one site, liquid from one process, or compactable personal protective equipment from one process.

- Implement administrative controls on the waste parcel to ensure that only allowable items are placed in the waste parcel.

Note: It is recommended that form [SF 2042-TRS](#), NTS Allowable Items ([Word file](#)), be prepared and placed on the waste parcel as a reminder of the only waste items that are allowed to be placed in the waste parcel. ([Attachment 19B-5](#), "Example NTS Allowable Items List," shows an example of a completed SF 2042-TRS, NTS Allowable Items form).



- Maintain [administrative controls](#) and [traceability](#) of waste parcels until they are picked up by the RWNMDD.
- Be aware of criticality issues related to the accumulation of radioactive waste if the process involves fissile material (see CPR400.1.1.11/[GN470072](#), Nuclear Criticality Safety, for more information).

Note: Also see [Section 19A](#), "Planning and Preparation – Waste Identification," for additional information on segregation and characterization of potential RCRA-regulated waste.

*WASTE CHARACTERIZATION - SAMPLING AND ANALYSIS



Requirements

[Primary waste generators](#) shall:

- Use sampling and analysis to complete characterization of the [waste parcel](#) when

process knowledge and waste control measures are not adequate for complete characterization.

Note: The primary waste generator pays the costs of sampling and analysis as part of the requirement to meet RWNMDD [waste acceptance criteria](#).

- Consult with the [waste characterization project leader](#) for assistance with the following:

- Developing a sampling and analysis approach such that data is representative of the waste, and determining whether a sampling and analysis plan is needed.
- Sampling the waste.

Note: Samples of waste shall be collected by trained Members of the Workforce according to specific sampling procedures.

- Interfacing with the appropriate Division ES&H Team for radiation protection coverage during the sampling event and for acquiring radiological survey data that could aid in characterization of the waste.
- Interfacing with the [Sample Management Office](#).
- Completing any necessary forms.

- When a sampling and analysis plan is required for a project, the primary waste generator shall:
 - Write the plan in accordance with [PLA 96-02](#), Sampling and Analysis Plan for Characterization of Low-Level Radioactive and Mixed Waste.
 - Ensure that the plan is reviewed by appropriate subject matter experts and by the Waste Characterization Team, and that the plan is approved.
 - Develop a schedule for updating the plan and supporting procedures at least every three years, if they are still in use.

Primary waste generators shall:

- Ensure that sampling and analysis data have gone through appropriate data verification and validation.

Note: Consult the waste characterization **project leader** for assistance on data verification and validation. The waste characterization **project leader** will determine whether data verification and validation are required for a specific data set. If such actions are deemed necessary, the Sample Management Office will perform data verification and validation.

- If it is unsafe or impractical to obtain representative samples because of high radioactivity or because of the heterogeneity of the waste material, the **primary waste** generator shall document why sampling and analysis could not be performed.

- **Note:** Sampling and analysis also may not be required if process knowledge and waste control are sufficient to estimate the activity of each radionuclide contaminant and to ensure that there is no RCRA-regulated **and/or state-regulated** waste or other prohibited item present (see the topic, "[Segregation and Control of Radioactive Waste](#)").

Naturally-occurring and other radioactive materials that are exempt from regulation (see CPR400.1.1.32/MN471016, *Radiological Protection Procedures Manual*, [Attachment 6-2](#), "Exempted Items List") may be present in some commercial products, including building materials, thoriated welding rods, Coleman® lantern mantles, glass that contains thorium or uranium for coloring purposes, camera lenses, and ceramics. Wastes containing naturally-occurring or other exempt radioactive materials do not require management as [radioactive waste](#), provided the criteria in [Attachment 19B-1](#), "Release of Non-Radioactive Waste," are met. Consult the appropriate Division ES&H Team environmental protection representative **or** the waste characterization **project leader** for assistance.

Note: The exemptions for naturally-occurring radioactive material and for consumer products, as discussed in Attachment 19B-1, "Release of Non-Radioactive Waste," do not apply to SNL/CA.

Guidance

[Primary waste generators](#) should consult the appropriate [Division ES&H Team](#)

environmental protection representative or the [waste characterization project leader](#) for assistance in reviewing the characterization data to determine the waste categorization (for example, radioactive waste, hazardous waste, mixed waste, or non-regulated waste).

Note: SNL has some radiological laboratory capabilities, but not full capabilities. For some analyses, samples must be sent to a commercial laboratory [that is state-certified or DOE-certified](#).

PROCESSING OF MATERIAL OR TREATMENT OF RADIOACTIVE WASTE

Note: This section applies only to treatment activities occurring on Sandia-controlled premises within the State of New Mexico.

Waste treatment at SNL/CA is not allowed unless special permits are obtained before treatment.

Requirements

[Primary waste generators](#) shall **not** do any of the following with radioactive material or waste unless written approval is obtained through their [Division ES&H Team](#) environmental protection representative:

- Treat radioactively-contaminated material as part of a process.
- Solidify radioactive waste.
- Recycle, dilute, or volume-reduce radioactive waste.
- Allow radioactive waste to evaporate or disperse into the atmosphere.

Note: For some processes, treatment of radioactive material or waste at the generator location may be the most efficient and cost-effective treatment approach. In most cases, it is preferred that treatment be implemented by the [radioactive and mixed waste treatment](#) contact after the waste is picked up by the RWNMDD.

Primary waste generators shall:

- Use an appropriate method and procedure to treat radioactive material or waste so that the disposal site can meet its performance objectives.

Note: If radioactive material or waste is to be treated in some manner, ensure that any specifications required to implement treatment are incorporated into the planning for management of the waste. For example, if liquid radioactive waste is to be treated using solidification, fill the waste container at most 50% full. The empty space will allow the solidification material to be added to the container.

- Ensure that solidification material is obtained from the radioactive and mixed waste treatment contact and is used in the correct amount if approved to conduct treatment is conducted at the generator location.

Guidance

Primary waste generators should:

- Consult the [radioactive and mixed waste treatment contact](#) for assistance in establishing an appropriate treatment method and procedure.

DISPOSAL REQUEST FOR PICKUP OF RADIOACTIVE WASTE

Requirements

[Primary waste generators](#) shall **not**:

- Do any of the following with [radioactive waste](#):
 - Allow the waste to enter sanitary sewer lines or storm sewers via sinks, toilets, etc.
 - Bury or release it to the ground, either directly or indirectly.



- Discard the waste into trash cans or dumpsters.
- Remove the waste from [Sandia-controlled premises](#).
- Manage radioactive waste in any manner that could be construed as disposal.
- Include any information on process knowledge forms or disposal request forms that are submitted with regard to classified waste that would cause the form itself to be a classified document. Consult the appropriate [Division ES&H Team](#) environmental protection representative or the [waste characterization project leader](#) for assistance in appropriately managing and characterizing classified waste.

Primary waste generators shall:



- Complete SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request (DR) Form ([website](#)) to request pickup of radioactive waste by the [Regulated Waste/Nuclear Material Disposition Department \(RWNMDD\)](#).

Note: Consult the appropriate Division ES&H Team environmental protection representative for assistance in completing the DR.

- Record each waste parcel on the DR.
- [Sign the Generator Waste Accumulation Disposal Log for each waste parcel when completed.](#)

Note: Multiple radioactive [waste parcels](#) can be submitted on one DR, but the waste in each parcel shall be of the same physical form as indicated on the DR, [unless an exception is granted by the waste characterization project leader.](#)



- Record the start date (the date that waste is first placed in a waste parcel) on the DR.
- Sign the DR if there is no SF 2042-PKE, SNL/NM Process Knowledge Evaluation Form, completed.
- Sign the DR.

Note: If the waste is not covered by SF 2042-PKE, SNL Process Knowledge Evaluation Form in the generator organization, then the “NTS Waste Stream Information,” section of the DR should not be completed by the primary waste generator.

The waste custodian in an organization generating waste shall do the following if the waste is covered by an SF 2042-PKE, SNL Process Knowledge Evaluation Form:

- Complete the “NTS Waste Stream Information” section of the DR.
- Sign the DR.

Note: In organizations that have a waste custodian, the waste custodian or the delegated representative can assist the primary waste generator in completing the DR.

The primary waste generator or waste custodian shall:

- Attach the following documents to the DR:

Document	Format
Process knowledge documentation	SF 2042-PKE, SNL Process Knowledge Evaluation Form (Word file), memo, or other suitable form.
Sampling and analysis results, as needed Note: Provided for radioactive waste that cannot be characterized through use of process knowledge and waste control.	SNL PLA 96-02 , <i>Sampling and Analysis Plan for Characterization of Low-Level Radioactive and Mixed Waste</i> .
The Generator Waste Accumulation Disposal Log Note: The log is included for each waste parcel that contains different items within a heterogeneous waste.	SF 2042-TRA, SNL Radioactive or Mixed Waste Disposal Request Form; or an equivalent form.

<p>Radiological survey documentation</p> <p>Note: Review the radiological survey form to ensure that:</p> <ul style="list-style-type: none"> • The form records survey/swipe results and dose rates on the double-contained waste parcel. • The Division ES&H Team radiation protection representative has completed and signed the form. 	<p>Radiological survey form.</p>
<p>Data verification and data validation documentation, as requested by the waste characterization project leader</p> <p>Note: This form is documented by the reviewer.</p>	<p>Data verification review form or data validation review form.</p>

- Submit the DR to the [radioactive and mixed waste operations contact](#) in a timely manner such that the waste is picked up within one year of the start date.

Note: Once the DR is approved by the RWNMDD, the RWNMDD pick-up crew will call to schedule pick-up of the radioactive waste.

- If needed, request an allowance to accumulate radioactive waste for longer than one year from the manager of the RWNMDD or the manager of the SNL/CA Environmental Management Department.

Guidance

If the [waste parcel](#) does **not** meet the RWNMDD [waste acceptance criteria](#) for an onsite storage facility (see SNL, [POL 95-01](#), *Programmatic Waste Acceptance Criteria [WAC]*), the waste parcel cannot be picked up by the RWNMDD, and the primary waste generator should do the following:

- Consult the [radioactive and mixed waste operations](#) contact for assistance in determining an appropriate storage area for the waste near the generator location,

and in developing a packaging method to meet waste acceptance criteria.



Primary waste generators should:

- Make a copy of the DR for the project file.

CERTIFICATION OF RADIOACTIVE WASTE

Requirements

Primary waste generators shall:

- Contact the [waste certification official](#) for assistance in meeting requirements such that the waste can be certified.
- Provide additional information that might be required by the waste certification official during certification or assessment activities.
- Provide additional information that might be required by the intended disposal facility to the waste certification official.

Note: The waste certification official periodically observes waste packaging activities that are conducted by the primary waste generator.

Note: The waste certification official periodically assesses waste management operations. A report is generated and provided to the primary waste generator and waste custodian, as appropriate. If a **finding** is identified, see “Nonconformances.”



NONCONFORMANCES

Requirements

When a nonconformance of procedure occurs that is related to management of

radioactive waste, primary waste generators shall ensure that:

- Their manager is notified.
- An SF 2042-NCA, SNL Nonconformance Corrective Action Report ([Word file](#)), is completed for the nonconformance and submitted to the [quality assurance program project leader](#).
- Corrective actions identified in the Nonconformance Corrective Action Report are implemented and documentation of implementation is provided to the quality assurance program project leader.

Guidance

[Primary waste generators](#) should:


- Implement the [OOPS](#) process as appropriate.
- Conduct and document self-assessments for compliance with [mixed waste](#) management requirements.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to management of [radioactive waste](#) include:

Hazard/Activity	Reference
Asbestos	Section 6B , "Asbestos.", Section 19F , "Other Waste."
Biological agents	Section 6N , "Biological Agents and Biosafety."

Chemical handling	<p>Section 6D, “Hazard Communication Standard.”</p> <p>Section 6E, “Laboratory Standard - Chemical Hygiene Plan.”</p> <p>CPR400.1.1.24/GN470094, <i>Handling Chemicals at SNL/CA.</i></p>
Chemical spills	Section 10E , “Chemical Spills.”
Confined space	Section 6I , “Confined Space Entry.”
Explosives	Chapter 9 , “Explosives Safety.”
Hazardous waste	<p>Section 19A, “Hazardous Waste Management.”</p> <p>CPR400.1.1.37/GN470075, <i>Guidelines for Waste Generators at SNL/CA.</i></p>
Lead bank	Section 10L , “Management of Excess Metallic Lead.”
Mixed waste	Section 19C , “Mixed Waste Management.”
Nuclear criticality	CPR400.1.1.11/GN470072 , <i>Nuclear Criticality Safety.</i>
Polychlorinated biphenyls (PCBs)	Section 10D , “Polychlorinated Biphenyl (PCB) Management.”
Pressurized drums	Section 10A , “Pressurized Drums.”
RMMAs	Section 19D , “Radioactive Material Management Areas (RMMAs).”
Radiation protection	Chapter 8 , “Occupational Radiation Protection.”

 <p>Recycling material</p>	<p>Section 4P, “Housekeeping.”</p> <p>CPR 500.2.3, <i>Property/Assets User's Manual</i>, “Identifying and Handling Excess Property, Chapter 5, “Identifying Excess Property.”</p>
<p>Respiratory protection</p>	<p>Section 6C, “Respiratory Protection.”</p>
<p>Toxic Substances Control Act (TSCA)</p>	<p>Section 6S, “Toxic Substances Control Act (TSCA).”</p>

*REFERENCES

Requirements Source Documents

[10 CFR 835](#), *Occupational Radiation Protection*.

[40 CFR 761](#), *Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*.

*[40 CFR, 700-789](#), *Toxic Substances Control Act Regulations*.

[42 USC 6901, et seq.](#), *Resource Conservation and Recovery Act of 1976*.

[42 USC 13106 et seq.](#), *Pollution Prevention Act of 1990*.

[DOE/NV-325](#), *Nevada Test Site Waste Acceptance Criteria (NTSWAC)*, Current Revision.

[DOE O 435.1, Chg 1](#) Radioactive Waste Management.

Implementing Documents

CPR400.1.1.11/[GN470072](#), *Nuclear Criticality Safety*.

CPR400.1.1.24/[GN470094](#), *Handling Chemicals at SNL/CA*.

CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.

CPR400.1.1.37/[GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.

SNL, [AOP 94-18](#), *Nonconforming Processes and Items*.

SNL, [PG470228](#), *Radioactive Waste Management Basis*.

SNL, [PLA 94-40](#), Program Plan for Managing Radioactive Material Management Areas (RMMAs).

SNL, [PLA 96-02](#), *Sampling and Analysis Plan for Characterization of Low-level Radioactive and Mixed Waste*.

SNL, [PLA 96-15](#), *Quality Assurance Plan (QAP)*.

SNL, [POL 95-01](#), *Programmatic Waste Acceptance Criteria (WAC)*.

SNL, [SMO-05-03](#), *Procedure for Completing the Contract Verification Review (CVR)*.

SNL, [Pollution Prevention Plan](#).

Related Documents

[10 CFR 30](#), *Rules of General Applicability to Domestic Licensing of Byproduct Material*.

[10 CFR 40](#), *Domestic Licensing of Source Material*.

[20 NMAC 3.1](#), *Licensing of Radioactive Material*.

[42 USC 2011 et seq.](#), *Atomic Energy Act of 1954 (AEA)*, as amended.

[DOE O 5400.5, Chg 2](#), *Radiation Protection of the Public and the Environment*.



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ES&H Manual

*SECTION 19D – RADIOACTIVE MATERIAL MANAGEMENT AREAS (RMMAs)

Subject Matter Expert: [David Castillo](#); CA Counterpart: [Albert Lau](#)

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*Indicates a substantive change



- [*Applicability](#)
- [Training](#)
- [Identification of Radioactive Material Management Areas \(RMMAs\)](#)
- [*Boundaries](#)
- [Establishment of a Radioactive Material Management Area \(RMMA\)](#)
- [Signs](#)
- [Radioactive Material Management Area \(RMMA\) Coordinator](#)
- [Abolishment of a Radioactive Material Management Area \(RMMA\)](#)
- [*Waste Disposal](#)
- [Related Hazards and Activities](#)
- [*References](#)
- Forms
 - SF 2001-ARM, Abolishing an RMMA form ([Word file/Acrobat file](#))
 - SF 2001-CHW, Certification Form for Hazardous Waste form ([Word file/Acrobat file](#))
 - SF 2001-ERM, Establishing an RMMA form ([Word file/Acrobat file](#))



*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities or processes on [Sandia-controlled premises](#) for which a reasonable potential exists for introducing radioactive contamination or causing activation of material that may become waste. This includes waste that is considered hazardous per the Resource Conservation and Recovery Act (RCRA) or the Toxic Substances Control Act (TSCA).

Note: The intent of the [Radioactive Material Management Area \(RMMA\)](#) Program is to ensure that **Sandia** does not ship radioactive contaminated waste from SNL facilities to commercial treatment, storage, or disposal facilities that are not licensed to handle **the waste**. To ensure this intent is met, wastes originating from an RMMA are managed as radioactive or mixed waste, as appropriate, unless the waste meets the criteria in [Attachment 19B-6](#), "Release of Waste."

TRAINING

Role or Work Activity	SNL/NM		SNL/CA	
	Required	Recommended	Required	Recommended
Members of the Workforce who work in a radioactive material management area (RMMA)	See note below	ENV112	ENV216	ENV112
RMMA coordinators			ENV235	

Note: No specific training is required for SNL/NM RMMAs. Training requirement is based on other ES&H hazards present in the area.

IDENTIFICATION OF RADIOACTIVE MATERIAL MANAGEMENT AREAS (RMMAs)

Requirements

Managers who own space shall determine the need for a [radioactive material management area \(RMMA\)](#) if an area meets the following criteria:

- There is a reasonable potential for radioactive contamination of material that will ultimately be sent to the Hazardous Waste Management Facility (HWMF). Examples of situations where the potential for radioactive contamination exists are:
 - The presence of unconfined or unencapsulated radioactive material.
 - Exposure to beams or other sources of radiation (neutrons, protons, etc.) capable of causing activation.
 - The space is posted as a contamination area, high contamination area, or airborne radioactive material area (see MN471016, *Radiological Protection Procedures Manual*, "[Glossary](#)," for more information).

Note: The requirement for an RMMA determination also applies to situations created by accidents or temporary conditions that require RMMA controls. Members of the Workforce should contact the environmental liaison on their [Division ES&H Team](#) if this situation occurs.

Managers responsible for environmental restoration (ER) sites that are areas of low-level, widespread radioactive contamination or areas that have potential underground radioactive contamination shall:

- Designate the areas as active or potential RMMAs and ensure that they are

tracked on an ER site tracking list.

- Reclassify a potential ER RMMA as an active ER RMMA as soon as soil-disturbing activities result in radioactive material coming to the surface.
- Ensure that ER sites that are not posted as RMMAs in the field are managed as RMMAs when operations occur.

Note: Due to the harsh outdoor environment and the extensive planning and preparation required for ER work (including posting), ER sites do not require RMMA posting to be maintained at the site.

Guidance

Members of the Workforce should **consult** the [Division ES&H Team contact](#) for assistance **to** determine **whether or not** an area meets the definition of an RMMA. Conditions that do **not** require an RMMA may include:

- Radioactive or activated material that is in a non-dispersible form and is not in a contamination area, high contamination area, or airborne radioactive material area (see MN471016, *Radiological Protection Procedures Manual*, "[Glossary](#)," for more information), or where activation is not possible.
- Activated material is limited to the target material, which is controlled as radioactive material or waste (unless activation potential exists outside the target area), and no loose surface contamination from the target exceeds guidelines in MN471016, *Radiological Protection Procedures Manual*, [Attachment 6-1](#), "Radioactive Contamination Limits."
- **Areas containing only naturally occurring or other exempt radioactive material (see [MN471016](#), *Radiological Protection Procedures Manual*, [Attachment 6-2](#), "Exempt Items List").**

*BOUNDARIES

Requirements

Managers shall use the following criteria to determine the boundaries of a [radioactive material management area \(RMMA\)](#):

- Surface contamination exceeds the levels given in MN471016, *Radiological Protection Procedures Manual*, [Attachment 6-1](#), "Radioactive Contamination Limits."
- Personal protective clothing and equipment (e.g., respirators, personal air samplers) are required for entry into the area.
- For a volume (i.e., a 3-dimensional space) in which a potential for activation exists, calculate the distance (radius) from the activation source within which activation is reasonably expected based on survey/monitoring results. The volume within this distance shall be established as an RMMA.

Guidance

Members of the Workforce should **consult** the **appropriate** [Division ES&H Team](#) **contact** to arrange for radiation surveys to delineate the extent of surface contamination for an area having a reasonable potential of being contaminated by unconfined radioactive material such as non-sealed sources.

ESTABLISHMENT OF A RADIOACTIVE MATERIAL MANAGEMENT AREA (RMMA)

Requirements

Managers shall:

- Document spaces that are determined to be [radioactive material management areas \(RMMAAs\)](#) on an Establishing an RMMA form (SF 2001-ERM) ([Word file](#)/[Acrobat file](#)).
- Submit the completed form to the SNL organization specified on Establishing an RMMA form (SF 2001-ERM) ([Word file](#)/[Acrobat file](#)). See the [RMMA](#) contact for




Guidance

Owners of RMMAs should keep a completed copy of the Establishing an RMMA form (SF 2001-ERM) ([Word file](#)/[Acrobat file](#)).

SIGNS

Requirements



Managers who own [radioactive material management areas \(RMMAs\)](#), except for outdoor environmental restoration (ER) sites, shall ensure that the RMMA is visibly posted with an RMMA insert, a sticker, or other appropriate sign to delimit RMMAs.

Guidance

Members of the Workforce should contact a radiological control technician (RCT) or the environmental liaison on their [Division ES&H Team](#) to obtain RMMA postings and for assistance with proper posting.

RADIOACTIVE MATERIAL MANAGEMENT AREA (RMMA) COORDINATOR



Requirements

Managers of [radioactive material management areas \(RMMAs\)](#) shall:

- Appoint an RMMA coordinator to manage the area.
- Report the name of the designated RMMA coordinator to the appropriate waste management personnel using an Establishing an RMMA form (SF 2001-ERM)

([Word file](#)/[Acrobat file](#)).

RMMA coordinators shall manage their RMMAs to ensure that:

- Each RMMA is posted so that all workers are aware of the RMMA. (For posting requirements for ER RMMAs, see "[IDENTIFICATION OF RADIOACTIVE MATERIAL MANAGEMENT AREAS \[RMMAs\]](#)".")
- No person generates waste within an RMMA that is destined for the Hazardous Waste Management Facility (HWMF) without being briefed on the waste disposal requirements.
- All waste (i.e., nonradioactive waste, mixed waste, radioactive waste) is properly segregated.
- Potential waste is minimized.
- The waste generated in an RMMA is managed in accordance with the following sections, including labeling requirements and any additional requirements set forth in [technical work documents](#):
 - [Section 19A](#), "Hazardous Waste Management"
 - [Section 19B](#), "Radioactive Waste Management"
 - [Section 19C](#), "Mixed Waste Management"
- All waste is characterized prior to requesting disposal.

Guidance

Managers should ensure that appointed RMMA coordinators work in or near the RMMAs or regularly visit their assigned RMMAs.

ABOLISHMENT OF A RADIOACTIVE MATERIAL MANAGEMENT AREA (RMMA)

Requirements

Managers or [radioactive material management area \(RMMA\)](#) coordinators shall do the following to request that an area be removed from the RMMA list:

- Verify that the area no longer meets the definition of an RMMA as demonstrated by surveys conducted by their [Division ES&H Team](#).
- Submit a completed Abolishing an RMMA form (SF 2001-ARM) ([Word file/Acrobat file](#)) and supporting radiological data (survey) relevant to the area's current radiological status to the SNL organization specified on the form. See the [RMMA](#) contact for assistance.

Note: An RMMA is not formally removed from the RMMA list until waste management personnel have reviewed the form and supporting documentation and has determined that the space meets release limits.

Guidance

Owners of **former** RMMAs should keep a copy of the completed Abolishing an RMMA form (SF 2001-ARM) ([Word file/Acrobat file](#)).

*WASTE DISPOSAL

Requirements

[Radioactive material management area \(RMMA\)](#) coordinators shall ensure that:

- Waste generated in an RMMA is managed appropriately, including proper characterization.
- Characterization of the waste is based on process knowledge and/or sampling and analysis of the waste matrix and radiological survey.

- A radiological survey is performed by a qualified radiological control technician (RCT) before waste is removed from an RMMA.



For hazardous waste that meets the criteria in ["Attachment 19B-6. "Release of Waste,"](#) waste generators shall:

li>Manage the waste and request disposal according to [Section 19A](#), "Hazardous Waste Management."

- Complete a Certification Form for Hazardous Waste form (SF 2001-CHW) ([Word file](#)/[Acrobat file](#)).
- Request that a radiological control technician (RCT) conduct a radiological survey of each waste package.
- Send the completed Certification Form for Hazardous Waste (SF2001-CHW) ([Word file](#)/[Acrobat file](#)), and a copy of the radiological survey to the Hazardous Waste Management Facility (HWMF) (Contact the appropriate Division ES&H Team for assistance).



For solid waste that meets the criteria in [Attachment 19B-6](#), "Release of Waste," waste generators shall manage the waste in accordance with [Section 19F](#), "Other Waste."

For waste that cannot be certified to meet the criteria in [Attachment 19B-6](#), "Release of Waste," waste generators shall consult the appropriate [Division ES&H Team](#) member for assistance in requesting disposal.

Guidance

Waste generators:

- Should describe waste generated in an RMMA by using process knowledge. This information is necessary for classifying waste. The following types of information should be available from process knowledge:
 - Radionuclides present, including radioactive decay products.
 - Type of waste matrix (for example, resins, oils, dry active solids, soil, activated metals, etc.).



- May characterize a waste as nonradioactive based on the generator's documented knowledge of the history of the waste, including:
 - Origin
 - Storage
 - Use
 - Segregation from potential radioactive exposure
- Should contact the environmental liaison on their [Division ES&H Team](#) for assistance if analytical methods are necessary for characterization.



Owners of RMMAs should:

- Keep copies of sampling and analysis results, including the results of radiological surveys performed to determine whether surface contamination levels are within guidelines per [MN471016](#), "*Radiological Procedures Manual, Attachment 6-1, 'Contamination Limits'*".
- Maintain waste as follows if it has been generated in an RMMA and, by process knowledge, is known to have no reasonable potential for being radioactively contaminated:
 - Keep the waste in a closed container to prevent radioactive material contamination.
 - Ensure the container is well-marked (e.g., "nonradioactive waste only").



RELATED HAZARDS AND ACTIVITIES

Hazards that may be present in [radioactive material management areas \(RMMAs\)](#) include:



Hazard/Activity	Reference
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Chemicals	GN470094 , <i>Handling Chemicals at SNL/CA</i> Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Hazardous waste	Section 19A , "Hazardous Waste Management" GN470075 , <i>Guidelines for Hazardous Waste Generators at SNL/CA</i>
Radiation, radioactive waste, or mixed waste	Section 19B , "Radioactive Waste Management" Section 19C , "Mixed Waste Generator Planning" GN470075 , <i>Guidelines for Hazardous Waste Generators at SNL/CA</i> Chapter 8 , "Occupational Radiation Protection"

*REFERENCES

Requirements Source Documents

[DOE 5400.5](#), *Radiation Protection of the Public and the Environment*.

[DOE O 435.1](#), *Radioactive Waste Management*.

DOE, *Clarification of Applicability and Responsibility Under the Moratorium on Offsite Shipment of Potentially Radioactive Waste*, July 6, 1993.

DOE, *Guidance on Establishment and Coordination of Authorized Limits for Release of Hazardous Waste Containing Residual Radioactive Material*, Office of Environmental

Management, January 1997.

Implementing Documents

SNL, [GN470075](#), *Guidelines for Hazardous Waste Generators at SNL/CA*.

SNL, [MN471010](#), *ES&H Training Catalog*.

SNL, [MN471016](#), *Radiological Protection Procedures Manual*.

SNL, [CPSR400.2](#), *Information Management*.

Related Documents

40 CFR 261.3, *Definition of Hazardous Waste*.

40 CFR 261.4, *Exclusions*.

42 USC 2011 *et seq.*, *Atomic Energy Act of 1954 (AEA)*, as amended.

[DOE 5700.6C](#), *Quality Assurance*.

DOE, *Performance Objective for Certification of Non-Radioactive Hazardous Waste Operations*, Office of Waste Operations, EM-30, May 17, 1991.

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CHAPTER 6 – INDUSTRIAL HYGIENE

MN471001, Issue AV

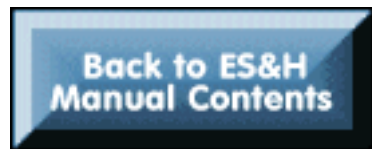
Revision Date: [April 23, 2007](#); Replaces Document Dated: April 19, 2007

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* Indicates a substantive change

- [Section 6A](#) - Industrial Hygiene Overview
- [Section 6B](#) - Asbestos
- [Section 6C](#) - Respiratory Protection
- [Section 6D](#) - Hazard Communication Standard
- [Section 6E](#) - Laboratory Standard - Chemical Hygiene Plan
- [Section 6F](#) - Commercial Underwater Diving
- [Section 6G](#) - Lasers and Intense Light
- [Section 6H](#) - Noise Exposure and Hearing Conservation
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- [Section 6J](#) - Nonionizing Radiation
- [Section 6K](#) - Hazardous Waste Operations and Emergency Response (HAZWOPER)
- [Section 6L](#) - Eating and Drinking
- [Section 6M](#) - Safety Showers and Eyewashes
- [Section 6N](#) - Biological Agents and Biosafety

- [Section 6P](#) - Local Exhaust Ventilation (LEV)
- [Section 6Q](#) - Nanomaterials
- [Section 6R](#) - Indoor Air Quality
- [Section 6S](#) - Toxic Substances Control Act (TSCA)
- [Section 6T](#) - Asphyxiating Environments
- [*Section 6U](#) - Hazardous Material (Chemical and Biological) Inventory
- [Section 6V](#) - Ergonomics
- [Section 6W](#) - Process Safety Management (PSM)
- [Section 6Y](#) - Thermal Stress
- [Section 6Z](#) - Chronic Beryllium Disease Prevention Program



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ES&H Manual

*SECTION 10H - DISCHARGES TO THE SANITARY SEWER SYSTEM

Subject Matter Expert: [Adrian Jones](#); CA Counterpart: [Robert Holland](#)

MN471001, Issue E

Revision Date: [August 5, 2003](#), Replaces Document Dated: September 18, 1997

* Indicates a substantive change



- [Applicability](#)
- [*Wastewater Discharges \(Process/Categorical\)](#)
- [*Categorical Process Discharges](#)
- [SNL's Liquid Effluent Control Systems](#)
- [Prohibitions and Limitations](#)
- [One-Time Discharges](#)
- [Spills and Accidental Releases](#)
- [Review of Routine Discharges](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - [*10H-1 - Examples of Categorical or Zero Discharge Processes](#)
 - [10H-2 - Interference Pollutants and POTW Concentration Standards That Apply](#)
 - [10H-3 - POTW Standards for Heavy Metals and Other Toxic Substances](#)



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all personnel conducting activities at all [Sandia-controlled premises](#).

Remote facilities such as TTR and KTF are also governed by all local control ordinances when discharging



[wastewater](#). Members of the Workforce at these sites should call the [Water quality](#) contact for discharge questions and guidance.

*WASTEWATER DISCHARGES (PROCESS/CATEGORICAL)

Requirements

Members of the Workforce shall submit documentation describing the amount, frequency, location, composition, and process associated with a discharge to the [Water Quality, Discharge Permit](#) contact for written approval for all [process discharges](#) to the [sanitary sewer system](#), except [sanitary waste](#).

New and Existing Processes

Managers of processes shall:

- Provide details to the Water Quality, Discharge Permit contact on all new and existing processes that discharge or have the potential to discharge to the [POTW](#).

Note: This information is compiled and submitted to the regulatory control authority, which analyzes the submittal and establishes limits and prohibitions on pollutants that may disrupt the operation of the POTW.

- Obtain the appropriate regulatory agency approval for their wastewater discharges, prior to beginning new processes, through the Water Quality, Discharge Permit contact for [wastewater](#) discharges.
- Maintain copies of discharge approvals and pertinent environmental permits and document their processes to show compliance with permit requirements. Examples of such documentation include:
 - Technical work documents (TWDs) describing the process.
 - Operational logs documenting process discharges.

Zero Discharge Processes

Managers shall:

- Document processes that have a zero discharge or only the potential to discharge (see examples in [Attachment 10H-1](#))
- Submit the documentation to the [Water Quality, Discharge Permit](#) contact.

Note: This documentation will be forwarded to the appropriate regulatory control authorities to aid in determining effluent limitations and EPA reporting requirements.

*CATEGORICAL PROCESS DISCHARGES

Requirements

New Process

Managers having a [categorical process](#) (e.g., printed circuit board manufacturing, plating, microelectronic fabrication, and chemical and materials research and development), prior to commencing a new categorical process shall:

- Consult the [Water Quality, Discharge Permit](#) contact before releasing any discharge.
- Receive approval from the appropriate regulatory control authorities before releasing any discharge.

Changes to Existing Process or Activity

Managers having a categorical process, before adding a new categorical process or changing an existing categorical process, shall receive discharge approval from the Water Quality, Discharge Permit contact before releasing any discharge from the added or changed process.

SNL's LIQUID EFFLUENT CONTROL SYSTEMS

Requirements

Members of the Workforce shall:

- **Not** discharge or dispose of the contents of SNL's Liquid Effluent Control System (LECS) holding tanks until they have been screened for pH and specific contaminants such as radioactive materials or metals.

Note: Consult the [Discharges standards screening contact](#).

- Discharge or dispose of tank contents as follows:

If Tank Contents...	Then...
Meet site discharge limits	Contents are released to the site's main sanitary sewer system .
Contain pollutants above discharge limits, but below hazardous waste criteria	Disposal is determined on a case-by-case basis at each site.

Meet hazardous waste criteria	Contents are handled and disposed as appropriate through the Waste Pickup, Hazardous contact.
-------------------------------	---

PROHIBITIONS AND LIMITATIONS




Caution:

Discharging [wastewater](#) with water added for the sole purpose of diluting or reducing the concentration of [pollutants](#) for discharge is prohibited.

Requirements

Members of the Workforce discharging process water with any pollutants that can interfere with or disrupt the operation or performance of the [publicly owned treatment works \(POTW\)](#) shall notify the [Water quality contact](#) for approval prior to discharge. (See [Attachment 10H-2](#) for some common examples of such pollutants and the New Mexico and California POTW standards that apply to them.)

Members of the Workforce shall **not** discharge wastewater that contains pollutants such as heavy metals or other toxic substances in excess of regulatory limits, as indicated in [Attachment 10H-3](#). Members of the Workforce shall call the [Water quality contact](#) for discharge guidance.

SNL/NM Members of the Workforce shall **not** discharge cooling water, [storm water](#), [reject water](#), any kind of unpolluted water, or any combination of these kinds of water in quantities greater than 2500 gallons per day without prior approval from the [Water quality contact](#).

SNL/CA Members of the Workforce shall notify the Water quality contact of all discharges that exceed 1000 gallons per day.

ONE-TIME DISCHARGES

Requirements

Managers shall call the [Water quality contact](#) to arrange an evaluation of one-time or batch discharges, which shall be reviewed on a case-by-case basis to determine whether the release is acceptable under current regulatory requirements or if it must be reported as an occurrence.

SPILLS AND ACCIDENTAL RELEASES

Requirements

Members of the Workforce shall:

- Report spills and accidental releases to the [sanitary sewer system](#) immediately according to requirements in [Section 18-E](#), "Environmental Release Reporting."
- Coordinate these reports with the [Water Quality, Wastewater contact](#), who will transmit the reports to DOE. DOE will submit reports to the appropriate regulators.

REVIEW OF ROUTINE DISCHARGES

Requirements

Members of the Workforce discharging to the [sanitary sewer system](#) or discharging a new or altered [wastewater](#) stream, including wastewater streams that have been altered as a result of connecting or modifying any process equipment or activity that discharges to the sanitary sewer system, shall meet the following requirements:

Site	Requirement
SNL/NM	Submit documentation describing the discharge to the Water quality contact .
SNL/CA	Call the Water quality contact , who will complete the documentation for you.

Members of the Workforce whose discharges are acceptable to the [Water quality contact](#) shall be issued a one-year site-specific Approval to Discharge to the Sanitary Sewer System.

Guidance

Members of the Workforce should do the following to minimize the potential for releases of pollutants into the sanitary sewer system,

- Develop preventive maintenance procedures to ensure that plant equipment and pollution control systems work properly.
- Perform and document internal assessments to verify that all of the pollution management elements are in place and working properly.
- Evaluate spill prevention and response procedures to reduce the potential for accidental releases.

- Evaluate discharges for elimination or minimization of pollutants and reducing volumes.
- Evaluate discharge processes for treatment options using best available technology economically achievable.
- Post signs at sinks and drains and at locations with potential for spills and accidental releases.

Members of the Workforce should follow these guidelines to help keep toxic substances from reaching drains that discharge to the sanitary sewer system:

Waste Chemicals:

- Don't dump chemicals into sinks or drains.
- Collect chemical wastes in carboys or other approved chemical waste containers and dispose of them properly (see [Section 19-A](#), "Hazardous Waste Management").
- Call the [Water Quality](#) or [Waste pickup contact](#) for disposal instructions.

Chemical Storage

- Store chemicals properly to avoid their accidental release to the sanitary sewer system.
- Use appropriate secondary containment. **Never** use a sink as secondary containment. (See [Section 10-F](#), "Oils, Greases, and Fuels," for general information about secondary containment.)

Preventing Pollution

- Reduce the amount of chemicals used.
- Have a spill response plan for your work area.
- Keep cleanup materials (spill kits) on hand.
- Know suitable spill cleanup responses for chemicals in the work area.
- Use plugs or covers to seal floor drains in areas where chemicals are stored.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activity	Reference
Environmental release reporting	Section 18E , "Environmental Release Reporting"

REFERENCES

Requirements Source Documents

City of Albuquerque, Chapter VIII, Article IX, *Sewer Use and Wastewater Control Ordinance*.

City of Livermore Municipal Code, Chapter 13.32, *Wastewater Collection and Treatment System*.

Implementing Documents

SNL, *Wastewater Sampling Plan*, October 1992.

SNL, PG470187, *Water Quality Program Document*, December 15, 1994.

SNL, *Wastewater Discharge Guidelines*, (question and answer pamphlets for Sandia, New Mexico and Livermore), February 1995.

Related Documents

40 CFR 110-140 and 40 CFR 400-470, *Clean Water Act*, (pertinent sections).

California Water Regulations (California Code of Regulations, Title 23 - Water Division 3 - State Water Resources Control Board, Chapter 6-15).

[DOE 5400.5](#), *Radiation Protection of the Public and the Environment*.

Hawaii Water Pollution Control Law and Regulations, *Water Quality Standards and Underground Injection Control Regulations*.

Nevada Water Pollution Control Law and Regulations; and the Underground Injection Control Regulations for the State of Nevada.

New Mexico Water Quality Regulations (New Mexico Water Quality Control Commission Regulations).

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ATTACHMENT 4N-24 – SHEET METAL SHEAR AND BREAK

Subject Matter Expert: [David Sepulveda](#); CA Counterpart: [Terry L. Garner](#)

MN471001, Issue L


Revision Date: [May 10, 2007](#); Replaces Document Dated: March 10, 2004

Review Date: November 13, 2006

Administrative Changes: [June 13, 2007](#)

In addition to these safety practices and guard requirements, follow instructions in applicable activity-specific technical work documents (TWDs) and manufacturers' manuals.

Safety Practices:

- 
- Wear approved safety glasses.
 - Do **not** wear neckties, loose sleeves, or loose-fitting garments.
 - Roll up long sleeves above the elbow.
 - Do **not** wear jewelry such as rings, bracelets, wristwatches, or necklaces.
 - Contain long hair; do **not** allow it to hang loose.
 - Wear gloves when handling sheet metal.
 - Check that the area around the machine is free of clutter, trip hazards, soiled rags, and flammable or combustible material.
 - Power shears and brakes should have auxiliary emergency power shut-off/stop switches. Locate these switches prior to machine operations.

- Do **not** attempt to shear or bend any brittle material on or with equipment that is **not** specifically designed to handle the hazards associated with the material.
- Plan and mark all shears or bends before beginning the operation.
- Do **not** exceed the equipment shearing and breaking ratings for the thickness or type of material.
- When operating the break, adjust the feet to the proper position for the desired bend angle/radius and tighten securely.
- Keep both hands on handle(s) during the entire shearing or bending process.
- Allow the machine to come to a complete stop before leaving the machine attempting to clean, adjust or repair the machine or remove stock.
- Report all equipment operation problems to management; tag the equipment for non-use and lock it out as necessary.

Guard Requirements:

- Ensure that the shears and breaks have point--of--operation guards that prevents entry of hands or fingers into the point of operations.



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* ATTACHMENT 6U-1 – BARCODING HAZARDOUS MATERIALS

Subject Matter Expert: [Randy Castillo](#); CA Counterpart: [Mark Brynildson](#)

MN471001, Issue E

Revision Date: [April 23, 2007](#); Replaces Document Dated: September 1, 2006

Review Date: August 16, 2006

Note: SNL maintains Material Safety Data Sheets (MSDSs) for hazardous materials (chemicals and biological materials) in accordance with [Section 6D](#), "Hazard Communication Standard."

Table 1. Items that **Require** Barcodes (Unless Exempted by Table 2)

Chemicals and biological materials known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency .
Epoxies and most glues (see exceptions below).
Microorganisms and biological toxins (Section 6N , "Biological Agents and Biosafety").
Pressurized chemical containers (includes gas, spray paints, or WD-40).
Solders (one barcode per spool).
Welding rods, metal powders, or metals that will be melted, sputtered, or somehow present an exposure hazard.

Table 2. Items that Do **Not** Require Barcodes

Analytical samples developed within SNL (e.g., soil samples from an ER site).
Articles .

Batteries in a sealed case such as standard size, store-type nickel cadmium or alkaline batteries, computer or radio batteries.

[Consumer products.](#)

Document shredder oils.

Food, drugs, or cosmetics.

Glue - Elmer's white glue, office-type glue sticks.

[Hazardous Waste](#) as defined by RCRA or [Hazardous Substances](#) as defined by CERCLA.

Ionizing or Non-ionizing Radiation Sources.

Janitorial products (tracked separately--MSDSs available through CIS).

Non-aerosol cleaning supplies (e.g., Windex, Ajax, white board cleaner).

[Portable containers](#) as defined by OSHA (e.g., acetone squeeze bottles).

Standard office supplies (e.g., compressed gas dusters, pens, ink pads, typewriter and printer ribbons, correction fluid, desk and office cleaners).

Tobacco or tobacco products.

Toner cartridges.

Wood or wood products (e.g., raw lumber, wood veneer, wood particle board).



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ATTACHMENT 1D-1 – SUSPENDING AND RESUMING WORK

Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)

MN471001, Issue P (O not used)

Revision Date: [May 25, 2007](#); Replaces Document Dated: June 28, 2006

Administrative Changes: June 8, 2007 and [July 2, 2007](#)

Members of the Workforce who believe they are observing work conditions or operations that represent a hazard to the person(s) performing the work or others should take the following actions:

Step	Action
1	Indicate concerns to the person(s) performing the work.
2	If a concern(s) isn't alleviated by explanation or other means provided by the person(s) performing the work, tell the person(s) to suspend the work activity until that person's manager or that contractor's Sandia delegating representative (SDR) directs them to restart their work.
3	<p>Whether the work continues or not, inform the following Members of the Workforce so they can take appropriate follow-up action:</p> <ul style="list-style-type: none"> • Appropriate manager • ES&H coordinator • Sandia delegated representative (SDR) • Space/equipment owner

4 If one of the individuals listed in [Step 3](#) cannot be contacted immediately, call the non-emergency hotline to report the concern (SNL/NM 844-6515, SNL/CA 294-3724).

Managers (for Sandia employees) and SDRs (for Sandia contractor personnel) shall **not** direct [suspended work](#) to resume until the work activity or condition is assessed to determine appropriate controls, abatement, or other resolution.

Managers who start or restart the following activities shall follow requirements in [Section 13D](#), "Readiness Review Process - Planning, Review, and Approval":

- Business Occupancy
- Standard Industrial Hazard
- Low-Hazard Nonnuclear
- Moderate- and High-Hazard Nonnuclear
- Accelerator
- Nuclear facilities



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CHAPTER 19 – WASTE MANAGEMENT

Subject Matter Expert: [Terry Cooper](#); CA Counterpart: [Deanna Dicker](#)
MN471001, Issue Y (X not used)
Revision Date: [July 13, 2006](#); Replaces Document Dated: June 15, 2006




* Indicates a substantive change

- [Overview](#)
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-

OVERVIEW

Waste is to be managed according to [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*, "Plan Work," safety management function.

CPR400.1.1/MN471001/*ES&H Manual*, Chapter 19, "Waste Management," describes the main institutional requirements relevant to waste management on [Sandia-controlled premises](#). Requirements within sections of Chapter 19 are based on the following types of [waste](#):

Applicable Section	Waste
<p>*Section 19A, "Hazardous Waste Management"</p> 	<p>Hazardous waste examples include but are not limited to the following:</p> <ul style="list-style-type: none"> ● A contained gas, liquid, or solid that is toxic, ignitable, corrosive, and/or reactive. ● Contaminated with or contains arsenic, barium, cadmium, chromium, lead, mercury, selenium, or silver. <p>Note: Requirements of Section 19A are applicable for explosive waste, unless the waste is contaminated with a radioactive component. In such case, the requirements of Section 19C apply.</p>
<p>Section 19B, "Radioactive Waste Management"</p>	<p>Radioactive waste: A solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954.</p>
<p>Section 19C, "Mixed Waste Management"</p> 	<p>Mixed waste: Contains both a hazardous waste component, as defined in Research Conservation and Recovery Act (RCRA) and implementing regulations, and a radioactive waste component.</p>
<p>Section 19D, "Radioactive Material Management Areas (RMMAs)"</p> 	<p>RMMA waste is generated in one of the following areas:</p> <ul style="list-style-type: none"> ● An area where the reasonable potential exists for radioactive contamination of RCRA/Toxic Substance Control Act (TSCA) hazardous waste due to the presence of unencapsulated radioactive material. ● An area that is exposed to radiation beams or other sources of particles (neutrons, protons, etc.) capable of causing activation of the RCRA/TSCA

	hazardous waste.
Section 19E , "Treatability Studies for Hazardous and Mixed Waste"	Waste that will undergo treatment as part of a laboratory-scale study that subjects the waste to a defined treatment process.
Section 19F , "Other Waste"	Waste that fails to meet the requirements for management as hazardous waste, low-level waste, mixed waste, or explosive waste.

REFERENCES

Implementing Documents

SNL, [CPR400.1.2](#), *Sandia National Laboratories' Integrated Safety Management System (ISMS) Description*.

Related Documents

SNL, [CPSR001.3](#), *Integrated Laboratory Management System (ILMS)*.

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SECTION 6F – COMMERCIAL UNDERWATER DIVING

Subject Matter Expert: [Patrick Murphy](#); CA Counterpart: N/A

MN471001, Issue F

Revision Date: [February 25, 2004](#), Replaces Document Dated: July 15, 1998

Administrative Changes: April 2, 2004, August 3, 2004, and [December 8, 2006](#)

* Indicates a substantive change



- [Applicability](#)
 - [*Diving Activities](#)
 - [*Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to all **Members of the Workforce whose activities include commercial underwater diving.**

*DIVING ACTIVITIES

Requirements

Managers who supervise Members of the Workforce performing [commercial underwater diving](#) activities and who conduct underwater diving activities using self-contained underwater breathing apparatus (SCUBA) and surface-supplied air (SSA) shall adhere to requirements in [29 CFR 1910, Subpart T](#), *Commercial Diving Operations*.

Members of the Workforce who conduct underwater dives at SNL/NM and KTF shall retain a **technical work document (TWD) that serves as a Safe Practices Manual** and includes the following documentation:

- A copy of [29 CFR 1910, Subpart T](#), *Commercial Diving Operations*.
- **Roles and responsibilities of the dive team members.**

Note: Roles and responsibilities can include dive assignments.

- Equipment manufacturers' operation and maintenance manuals.
- **Procedures and checklists for diving that:**
 - **Allow users to outline the various methods employed, the specific operations or tasks to be completed, and completion status.**
 - **Outline proper equipment and tool usage for dive operations.**
 - **Provide information and guidance for fire, equipment failure, and adverse environmental condition emergencies, as well as medical illness and injury.**

TWDs written to meet these requirements shall also follow the general TWD requirements provided by [Chapter 21](#), "Technical Work Documents (TWDs)."

Guidance

For assistance on compliance issues, Members of the Workforce should contact their

*RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Self-contained underwater breathing apparatus (SCUBA) and compressed-air volume tanks	CPR400.1.1.27/MN471000 , <i>Pressure Safety Manual</i>
Responding to accidents and injuries	Chapter 16 , "Health, Benefits, and Employee Services"
Procedures for reporting occurrences	Section 18C , "Occurrence Reporting"
Technical Work Documents	Chapter 21 , "Technical Work Documents (TWDs)"

REFERENCES

Requirements Source Documents

[29 CFR 1910, Subpart T](#), *Commercial Diving Operations*.

[29 CFR 1910.151](#), *Medical Services and First Aid*.

[DOE 5480.10](#), *Contractor Industrial Hygiene Program*.

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.



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ES&H Manual

SECTION 18F – REPORTING VEHICLE ACCIDENTS AND PROPERTY DAMAGE

Subject Matter Expert: [Willie J. Johns](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue G

Revision Date: [January 13, 2005](#); Replaces Document Dated: May 31, 2000

Review Date: December 17, 2004

* Indicates a substantive change



- [Applicability](#)

- [*Reporting Accidents that Involve Vehicle Damage](#)

- [*Reporting Property Damage](#)

- [*Preserving the Accident Scene](#)

- [Related Hazards and Activities](#)

- [*References](#)

- Form

- [GSA SF 91](#), Motor Vehicle Accident Report

- [*SF 2001-PVAR, Preliminary Vehicle Accident Report \(Word file/Acrobat file\)](#)

APPLICABILITY



For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all [vehicle](#) accidents or property damage when incurred by

Members of the Workforce who are conducting **Sandia** business.

*REPORTING VEHICLE ACCIDENTS

Requirements

Managers shall be responsible for **ensuring that**:

- Members of the Workforce are informed of the policy regarding the use of government [vehicles](#) and for reporting vehicle accidents.
- Vehicle damage of \$1,000 or more is reported to the vehicle accident to:
 - **The traffic safety contact in the Industrial Hygiene and Safety Programs Department (10322/MS 1037).**
 - DOE, if it meets the occurrence reporting criteria (see "[Handling Events](#)" in Section 18C, "Occurrence Reporting").
- Accidents that have been determined to be a reportable occurrence are investigated and causes and corrective actions are identified, which can then be recorded and processed by the [traffic safety contact](#).
- The [California Department of Motor Vehicles \(DMV\)](#) is notified when any of the following results from a vehicle accident:
 - Vehicle damage exceeds **\$750**
 - Injury, regardless of severity
 - Death.

The appropriate Facility Manager/Designee or ES&H coordinator shall, for accidents requiring an occurrence report, prepare the report and submit it to an occurrence management representative (OMR) for processing (see "[Handling Events](#)" in Section 18C, "Occurrence Reporting").

Members of the Workforce shall:

- Inform responsible managers of **any** accidents that have resulted in personal injury or damage to a vehicle that was approved for use and was being used in the conduct of **Sandia** business.
- Follow the instructions in the Table 1, "Reporting Vehicle Accidents"
- In addition, at SNL/CA, make a report to the California DMV within 10 days, whether or not the Member of the Workforce caused the accident, and even if the accident occurred on private property. See the CA Driver Handbook, "[Reporting the Accident to DMV](#)," for additional information.

Table 1. Reporting Vehicle Accidents

Reporting Vehicle Accidents		
Type of Vehicle	Location of Accident	Action
GSA vehicle	A. Offsite	<ol style="list-style-type: none"> 1. Notify local police. 2. Complete the steps in C below.
	B. Onsite	<ol style="list-style-type: none"> 1. Notify the Sandia security contact. 2. Notify the facility manager/designee for possible occurrence reporting. 3. Notify the traffic safety contact in the Industrial Hygiene and Safety Programs Department (10322/MS 1037). 4. Complete the steps in C below.

C. [Onsite](#) or
[Offsite](#)

1. Complete the Preliminary Vehicle Accident Report (SF 2001-PVAR [Word file/Acrobat file](#)). See the report for the required information.
2. Report the accident to the GSA Accident Control Center (GSA-ACC) at 1-800-325-2958 within 24 hours of accident.
3. Complete [GSA Standard Form 91](#), "Motor Vehicle Accident Report" (located in the glove box of each vehicle). The form **shall be completed within 5 working days** and faxed to GSA-ACC at 1-816-823-3634. **Submit the original copy to the traffic safety contact in Department 10322/MS1037.**

Note: GSA will arrange for a vehicle damage estimate.

4. If other persons were involved in the accident, fax the following information about each individual, as applicable, to the GSA-ACC at 1-816-823-3634:
 - Name
 - Address
 - Phone number
 - Name of insurance company and policy number
 - Vehicle license plate number
5. Fax a copy of the police report to the GSA-ACC at 1-816-823-3634.
6. Report the accident to Sandia Fleet





Management at (505) 284-2543 within 1 workday of the accident.

7. If you are a Sandia employee who was injured in an accident while on official travel, report to a Sandia health services facility prior to returning to work to initiate an [SF 2050-P](#), [Report of Occupational Injury/Illness](#). Failure to do so may jeopardize worker compensation benefits.
8. Retain copies of any documents created during the initial and subsequent investigations.
9. If the accident involved vehicles transporting hazardous material, immediately notify the DOT at 800-424-8802. Complete DOT Form F5800.1.

E-plated (Sandia-owned) vehicles

A. [Offsite](#)

1. Notify the local police.
2. Complete the steps in C below.

B. [Onsite](#)

1. Notify the [Sandia security](#) contact.
2. Notify the facility manager/designee for possible [occurrence](#) reporting.
3. Notify the traffic safety contact in Department 10322.
4. Complete the steps in C below.





<p>C. Onsite or Offsite</p>	<ol style="list-style-type: none"> 1. Complete the Preliminary Vehicle Accident Report (SF 2001-PVAR Word file/Acrobat file). See the report form for a description of the required information. 2. Complete GSA Standard Form 91, Motor Vehicle Accident Report (located in the glove box of each vehicle). Form 91 shall be completed and faxed to Fleet Management at 844-3086 within 1 workday of the accident. Submit the original to the traffic safety contact in Department 10322. 3. Retain copies of any documents created during the initial and subsequent investigations.
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Rental vehicle used for Sandia business

<p>A. Offsite</p>	<ol style="list-style-type: none"> 1. Notify local police. 2. Complete the steps in C below.
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<p>B. Onsite</p>	<ol style="list-style-type: none"> 1. Notify the Sandia security contact. 2. Complete the steps in C below.
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<p>C. Offsite or Onsite</p>	<ol style="list-style-type: none"> 1. Notify the rental company and complete any accident forms required by that company. The forms are usually located in the vehicle glove box. 2. If the car was rented from a company other than Avis, notify US Bank (corporate VISA card company) at 1-800-VISA-911 within 20 days of the date of the accident.
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3. Notify the [Pension Fund & Savings Plan](#) contact if the Sandia driver was at fault and the damage is likely to exceed the limits of the rental car policy coverage. See Travel Bulletin, December 1999, or call the Travel Hot Line at 844-8785 for specific information on insurance coverage limitations. Also see CPR500.1.1, *Financial Manual*, [Section 18.1](#), "Employee Travel Expenses," and [Section 18.2](#), "Employee Business Expenses."

Note: If the driver abuses the rental vehicle, drives recklessly, or drives under the influence of alcohol or drugs, the driver is liable for the full amount of any loss or damage.

4. At [SNL/NM](#) and [SNL/CA](#), notify the traffic safety contact in Department 10322.
5. At TTR, notify the site ES&H coordinator.
6. At KTF, notify the resident range manager.
7. Retain copies of the police report, rental agreement, accident report, and insurance documentation for the vehicle rental agency.
8. If you are a Sandia employee who was injured in an accident while on official travel, report to a Sandia health services facility prior to returning to work to initiate an [SF 2050-P](#), Report of Occupational Injury/Illness. Failure to do so may jeopardize worker compensation benefits.

<p>Private vehicle used for Sandia business (for which a mileage allowance is provided)</p>  	<p>Offsite or Onsite</p>	<ol style="list-style-type: none"> 1. Notify the Sandia security contact. 2. Notify your immediate manager. 3. At SNL/NM and SNL/CA, notify the safety engineering representative. 4. At TTR, notify the site ES&H coordinator. 5. At SNL/CA, notify the California Department of Motor Vehicles (DMV) if: <ul style="list-style-type: none"> ○ Vehicle damage exceeds \$750. ○ Anyone was injured (regardless of severity). ○ A death occurred. 6. At SNL/CA, Members of the Workforce shall make a report to the California DMV within 10 days, whether or not the Member of the Workforce caused the accident and even if the accident occurred on private property. See the CA Driver Handbook, "Reporting the Accident to DMV", for additional information.
<p>Commercial motor vehicle (CMV)</p>	<p>Offsite or Onsite</p>	<ol style="list-style-type: none"> 1. Report vehicle accidents to the Federal Motor Carrier Safety Regulations (FMCSR) Administrator. A copy of GSA Standard Form 91, "Motor Vehicle Accident Report," is sufficient. 2. If you are a Sandia employee who was injured in an accident while on official travel, report to a Sandia health services facility prior to returning to work to initiate



an [SF 2050-P](#), Report of Occupational Injury/Illness. Failure to do so may jeopardize worker compensation benefits.

- As soon as practical, following an occurrence involving a commercial motor vehicle operating on a public road for business purposes, surviving Members of the Workforce involved in the accident shall be readily available for testing for alcohol or controlled substances within 8 hours and 32 hours respectively, of the occurrence.

The following table notes when a post-accident test is required to be conducted:

Type of Accident Involved	Citation issued to the CMV driver?	Test must be performed?
Human fatality	Yes No	Yes No

Bodily injury with immediate medical treatment away from the scene	Yes No	Yes No
Disabling damage to any motor vehicle or to any motor vehicle requiring tow away	Yes No	Yes No

*REPORTING PROPERTY DAMAGE

Requirements

Members of the Workforce shall report all property damage to their managers and the manager to whom the property is assigned.

Managers to whom property is assigned shall, in the event of property damage:

Step	Action
1	Notify the appropriate facility manager/designee or ES&H coordinator for possible occurrence reporting. At SNL/CA, notify the Incident Investigation Team at 294-3724.
2	Investigate events resulting in damage, other than from fire, and consult the traffic safety contact in Department 10322/MS1037 . If the damage involves Sandia-owned special-use equipment (e.g., cranes, construction equipment, powered carts), notify the Fleet Services hotline at (505) 284-2543 within 1 workday of the accident. At SNL/CA, notify the Incident Investigation Team at 294-3724.
3	Retain copies of any documents created during the initial and subsequent investigations in accordance with the Corporate Records Retention and Disposition Schedule .

Note: Sandia fire protection engineers who investigate damage resulting from fire or from activation of fire protection systems may contact Members of the Workforce during the investigation.

*PRESERVING THE ACCIDENT SCENE

Requirements

Managers shall direct personnel to preserve, to the extent feasible, and document evidence of accidents involving vehicles or property damage (see "[Unplanned Conditions or Events and Emergency Response](#)," in Section 2D, "Perform Work").

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [vehicle](#) or property damage include:

Hazard/Activity	Reference
Powered carts	Section 4S , "Use of Powered Carts"
Reporting emergencies	Chapter 15 , "Emergency Preparedness and Management"
Traffic safety	Section 4K , "Traffic Safety"

*REFERENCES

Requirements Source Documents

[49 CFR 382.303](#), *Post-Accident Testing*.

[DOE M 231.1-1](#), *Environment, Safety and Health Reporting Manual*.

[DOE O 231.1](#), *Environment, Safety and Health Reporting Requirements*.

[DOE O 232.1A](#), *Occurrence Reporting and Processing of Operations Information*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Related Documents

ANSI D.15.1, *ANSI Method of Recording & Measuring Motor Vehicle Fleet Accident Experience*.

DOE 76-45, SSDC 78, *DOE Guide to the Classification of Recordable Accidents*, (Sec III.)

Standard Article (S.A.) 603-LB, (IV), *Contractor or Subcontractor Use of Government-Owned Vehicles.*

State of California, [California Vehicle Code](#).



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HOW TO USE THIS MANUAL

Subject Matter Expert: [Bob Goetsch](#)

MN471001, Issue C

Revision Date: September 21, 1998, Replaces Document Dated: July 31, 1995

Where to Start

Use the *ES&H Manual* to find criteria on how to be in compliance with ES&H requirements.

Members of the Workforce should familiarize themselves with:

- General ES&H requirements and responsibilities as described in [Chapter 1](#), "Introduction to ES&H."
- Elements of SNL's Integrated Safety Management System (ISMS), that cut across all ES&H programs, as described in [Chapter 2](#), "Cross-Cutting Elements."

Use of Primary Hazard Screenings (PHSs)

Review PHSs to identify your work hazards and for pointers to appropriate *ES&H Manual* chapters or sections that contain instructions for controlling those hazards.

There is an on-going effort to make the *ES&H Manual* complete, accurate, and applicable to all Sandia sites. However, the *ES&H Manual* contains a compilation of requirements that continue to change. Consequently, no matter how often it is updated and reissued to address requirements or safety issues, parts of it may be out of date. Contact the author or appropriate [Division ES&H Team](#) with questions.

How to Locate Information

To locate information in the *ES&H Manual*, go to [Search ES&H Manual and Supplements](#) and enter your topic.

How to Recognize Requirements vs. Guidance

The *ES&H Manual* chapters and sections are formatted with "Requirement" and "Guidance" headings. Requirements include the word "[shall](#)." Guidance includes words such as "[should](#)" or "[may](#)." To minimize redundancy and inconsistencies between sections of this manual, the format includes a number of links between different sections of the manual. To ensure that you have all the requirements and guidance information applicable to the subject, look at all hyperlinks within each section.

How to Use References

A "Reference" section is included at the end of each *ES&H Manual* chapter or section and is separated under the following subheads:

- "Requirements Source Documents" for those that describe specific requirements from regulations or DOE orders.
- "Implementing Documents" for those that describe how to implement requirements at SNL.
- "Related Documents" for those that provide additional information, recommendations, industry standards, and best management practices.

How to Recognize Changes

Significant substantive changes to content are indicated by an asterisk (*) at the beginning of the heading for the text containing the change.

Significant substantive additions to content are indicated by two asterisks (**) at the beginning of the heading for the text containing the addition.

For attachments, asterisks are often attached to the attachment title.

How to Locate Definitions


The [ES&H Manual Glossary](#) contains a compilation of terms and acronyms defined in the text.

How to Submit Errors, Omissions, or Comments

Submit errors, omissions, or comments to the author and the *ES&H Manual* manager who are both e-mail enabled at the end of each chapter or section.

Where to go for Additional ES&H Information

Contact:

- 
- Your [Division ES&H Team](#).
 - [ES&H Direct Access Services](#).

ES&H Manual Committee

The *ES&H Manual* Committee was chartered in 1996 to develop the following:

- Vision and Mission Statement
- Authority and Responsibilities
- Membership
- Operational Guidelines.



ES&H Manual Processes

Procedures on how to revise, review, and approve the *ES&H Manual*, as well as information on other manual processes, can be found at the [ES&H Manual Committee \(ESHMC\) Resources](#) home page.



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ES&H Manual



LIST OF EFFECTIVE SECTIONS

MN471001, Issue HV

Revision Date: [June 29, 2007](#); Replaces Document Dated: June 26, 2007

*Indicates a substantive change.

Title	Issue	Revision Date	Review Date
ES&H Manual, Supplements, Supplemental Manuals Notification Form for Errors and Omissions	C	7/31/95	
How to Use This Manual	C	9/21/98	
*List of Effective Sections	HV	6/29/07	
Glossary	DT	6/8/07	
Chapter 1 - Introduction to ES&H, Table of Contents	P (O not used)	5/25/07	9/20/04
Section 1A - Why ES&H	J (I not used)	9/21/98	
Section 1B - What is the Scope	L	11/04/04	9/20/04
Section 1C - How ES&H is Implemented	J (I not used)	9/21/98	
Section 1D - Who Does What	P (O not used)	5/25/07	
Chapter 2 - Cross-Cutting Elements, Table of Contents	R (Q not used)	11/15/06	
Chapter 2 Overview	A	9/21/98	
Section 2A - Plan Work	D	10/25/99	

Section 2B - Analyze Hazards	A	9/21/98	
Section 2C - Control Hazards	B	11/15/06	
Section 2D - Perform Work	C	5/25/07	5/10/04
Section 2E - Feedback and Improve	A	9/21/98	
Chapter 3 - Office Safety	E	11/9/00	
Chapter 4 - Industrial Safety, Table of Contents	BV	5/10/07	
Section 4A - Working in High-Injury- Potential/Remote Operations	D	8/18/97	9/16/04
Section 4B - Electrical Safety Practices	JK	10/19/06	6/13/06
Section 4C - Lockout/Tagout	P (O not used)	9/7/06	3/13/06
Section 4D - Pressure Safety Operations	F	4/13/99	9/16/04
Section 4E - Hot Work Safety	L	3/19/07	9/13/06
Section 4F - Ladders, Scaffolds, and Elevating Work Platforms	H	2/23/05	11/23/04
Section 4G - Fall Prevention/Fall Protection	F	10/2/06	9/18/06
Section 4H - Excavations, Trenches, and Floor or Wall Penetrations	G	9/29/06	9/26/06
Section 4I (Not Used)	-	-	
Section 4J - Material Handling - Cranes, Hoists, and Forklifts	K	11/28/06	2/09/06
Section 4K - Traffic Safety	H	11/9/06	03/15/07
Section 4L - Personal Protective Equipment (PPE)	K	6/26/06	9/19/03
Section 4M - Signs (Including SWHAS) and Tags	C	12/16/98	
Section 4N - Industrial Machine and Portable Power Tool Safety	L	5/10/07	11/13/06
Section 4O (Not Used)	-	-	

Section 4P - Housekeeping	C	9/30/97	
Section 4Q (Not Used)	-	-	
Section 4R - Light and Heavy Earth Moving Equipment	D	1/28/98	
Section 4S - Use of Powered Carts	C	6/26/06	
Section 4T - Firearms Safety	BC	10/30/06	10/18/06
Section 4U - Aviation Safety	A	1/28/98	
Section 4V - ES&H for Contracted Construction and Construction-Like Activities	E	5/8/07	4/25/07
Section 4W - Asphyxiating Environments	Cancelled	5/23/05	
Chapter 5 - Fire Protection	L	2/7/07	3/21/06
Chapter 6 - Industrial Hygiene, Table of Contents	AV	4/23/07	
Section 6A - Industrial Hygiene Overview	D	9/30/97	
Section 6B - Asbestos	F	5/8/06	5/1/06
Section 6C - Respiratory Protection	E	8/30/00	
Section 6D - Hazard Communication Standard	F	6/26/06	6/12/06
Section 6E - Laboratory Standard - Chemical Hygiene Plan	F	6/28/06	6/19/06
Section 6F - Commercial Underwater Diving	F	2/25/04	
Section 6G - Lasers and Intense Light	E	12/1/06	4/18/06
Section 6H - Noise Exposure and Hearing Conservation	E	2/12/04	
Section 6I - Confined Space Entry	K	4/19/07	2/19/07
Section 6J - Nonionizing Radiation	E	11/22/02	

Section 6K - Hazardous Waste Operations and Emergency Response (HAZWOPER) (This section was renamed and changed to split the topics into their individual sections: 6B, 6F, 6K, 6L, 6M, 6N and 6V.)	F	6/28/06	6/19/06
Section 6L - Eating and Drinking	E	7/15/98	
Section 6M - Safety Showers and Eyewashes	F	10/30/01	
Section 6N - Biological Agents and Biosafety	J (I not used)	6/28/06	6/14/06
Section 6O (Not Used)			
Section 6P - Local Exhaust Ventilation (LEV)	E	6/26/06	
Section 6Q Nanomaterials	A	3/19/07	
Section 6R - Indoor Air Quality	B	1/8/98	9/19/03
Section 6S - Toxic Substances Control Act (TSCA)	C	6/28/06	6/13/06
Section 6T - Asphyxiating Environments	A	9/29/06	
Section 6U - Hazardous Material (Chemical and Biological) Inventory	E	4/23/07	8/16/06
Section 6V - Ergonomics	A	12/3/97	
Section 6W - Process Safety Management (PSM)	A	6/26/01	9/16/04
Section 6Y - Thermal Stress S	B	06/21/06	
Section 6Z - Chronic Beryllium Disease Prevention Program	B	7/13/06	7/10/06
Chapter 7 - Accountability and Operational Modes for Facilities	A	7/15/98	
Chapter 8 - Occupational Radiation Protection	J (I not used)	12/22/97	
Chapter 9 - Explosives Safety	G	12/15/06	

Chapter 10 - Environmental Protection, Table of Contents	AS	11/9/06	
Section 10A - Pressurized Drums	B	3/30/99	
Section 10B - National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties	F	8/12/05	
Section 10C - Migratory Birds, Protected Species and Other Biota	C	3/16/06	3/7/06
Section 10D - Polychlorinated Biphenyl (PCB) Management	F	4/19/01	
Section 10E - Chemical Spills	F	6/10/97	10/8/01
Section 10F - Oils, Greases, and Fuels	G	11/9/06	3/10/06
Section 10G - Potable Water	A	5/31/05	
Section 10H - Discharges to the Sanitary Sewer System	E	8/5/03	
Section 10I (Not Used)	-	-	
Section 10J - Registering, Naming, and Labeling Bulk Storage Tanks	A	5/20/98	
Section 10K - Underground Storage Tanks	Cancelled	5/18/06	
Section 10L - Management of Excess Metallic Lead	F	4/25/06	
Section 10M (Not Used)	-	-	
Section 10N - Discovering and Reporting a Potential Past Waste Release Site	D	11/04/04	6/21/04
Section 10O (Not Used)	-	-	
Section 10P (Not Used)	-	-	
Section 10Q (Not Used)	-	-	
Section 10R (Not Used)	-	-	
Section 10S (Not Used)	-	-	

Section 10T - Surface and Storm Water Discharges	D	01/26/04	
Section 10U - Scrap Metal From a Radiological Area or Volumetrically Contaminated Metal	A	1/14/02	
Chapter 11 - ES&H Training	K	4/9/07	2/24/05
Chapter 12 - Packaging and Transportation of Hazardous Material, Table of Contents	J (I not used)	1/5/07	
Section 12A - Onsite Packaging and Transportation (P&T) of Hazardous Material	A	5/2/05	
Section 12B - Offsite Shipment and Transport of Hazardous Material	A	5/2/05	
Section 12C - Commercial Motor Vehicles (CMVs) and Commercial Driver's Licenses (CDLs)	B	1/5/07	11/6/06
Chapter 13 - Hazards Identification/Analysis and Risk Management, Table of Contents	U	4/12/07	
Section 13A - Hazards Identification and Classification Process	F	4/12/07	9/22/06
Section 13B - Hazards Analysis Process	G	4/19/01	
Section 13C - Authorization Basis Process	H	5/08/03	
Section 13D - Readiness Review Process - Planning, Review, and Approval	C	9/21/06	9/18/06
Section 13E - Risk Criteria for Flight Vehicle Operations	B	10/05/04	6/30/04
Chapter 14 (Not Used)			
Chapter 15 - Emergency Preparedness and Management	H	8/20/04	3/1/04

*Chapter 16 - Benefits and Health Services	M	6/26/07	3/20/06
Chapter 17 - Air Emissions, Table of Contents	H	3/7/07	
Section 17A (Not Used)	-	-	
Section 17B - Air Permits	J(I not used)	3/5/07	8/5/05
Section 17C - Air Emissions Control Measures	C	12/11/97	
Section 17D - Ozone Depleting Substances (ODSs)	D	4/13/99	
Section 17E - Radionuclide National Emissions Standards for Hazardous Air Pollutants (NESHAP)	C	1/21/98	
Chapter 18 - Reporting, Investigating, and Correcting ES&H Events, Table of Contents	P (O not used)	5/25/07	
Section 18A - Reporting ES&H Concerns and Suggestions for Improvement	C	5/25/07	7/3/03
Section 18B - Safety Engineering Accident Investigation (AI) Process	B	3/19/07	2/26/07
Section 18C - Reporting Occurrences	G	09/23/04	8/16/04
Section 18D (Not Used)	-	-	
Section 18E - Environmental Release Reporting	E	12/16/98	
Section 18F - Reporting Vehicle Accidents and Property Damage	G	1/13/05	
Section 18G - Identifying, Reporting, and Correcting Nuclear Safety Nonconformances	D	4/12/07	1/8/07
Chapter 19 - Waste Management, Table of Contents	Y (X not used)	7/13/06	

Section 19A - Hazardous Waste Management	M	7/13/06	9/21/04
Section 19B - Radioactive Waste Management	M	6/15/06	12/9/04
Section 19C - Mixed Waste Management	L	6/15/06	6/04/06
Section 19D - Radioactive Material Management Areas (RMMAs)	E	8/5/03	
Section 19E - Treatability Studies for Hazardous and Mixed Waste	E	10/6/97	
Section 19F - Other Waste	C	5/8/06	5/20/04
Chapter 20 (Not Used)	-	-	
Chapter 21 - Technical Work Documents (TWDs)	D	6/22/06	
Chapter 22 - Feedback and Improvement Processes, Table of Contents	K	4/13/07	
Section 22A - ES&H Self-Assessment (SA) Activities	F	4/13/07	11/10/04
Section 22B - Root Cause Analysis (RCA)	C	09/23/04	8/16/04
Section 22C - Lessons Learned (Last Issue of <i>ES&H Manual</i> , Section 22C, Issue C is replaced by ESH100.5.3 below)	C	09/23/04	8/16/04
Section 22D - Corrective Action Development, Verification of Completion, and Validation of Completion	A	12/20/05	
Section 22E - Environment, Safety, and Health and Emergency Management Corrective Action Management Program (CAMP)	B	8/2/06	
Chapter 23 - Contracted Activities	A	6/8/07	

Section 23A - Service and Construction Contracts	A	6/8/07	
Section 23B - Onsite Contracts	A	6/8/07	
*ES&H Corporate Policies			
*ESH100.5.3 - Lessons Learned	A	6/29/07	



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ES&H Manual

SECTION 1A – WHY ES&H


Subject Matter Expert: [Nancy Linarez-Royce](#); CA Counterpart: [Dennis J. Beyer](#)

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* Indicates a substantive change

- 
- [Contracts and Commitments](#)
 - [*Policies and Principles](#)
 - [Consequences and Liabilities](#)
 - [*References](#)
-

CONTRACTS AND COMMITMENTS

Management and Operating Contract

[DE-AC04-94AL85000](#), *Management and Operating Contract Between Sandia Corporation and DOE*, defines the primary contractual obligations for operating Sandia. This contract drives Sandia ES&H policy and specifies ES&H standards and requirements for all SNL facilities and operations.



Sandia Commitment

Sandia is committed to protecting the environment and to preserving the health and safety of workers and the community. This commitment is further defined in the Infrastructure strategic objectives of the *Sandia Strategic Plan 1997* and the

Infrastructure goals and milestones of the *Sandia Institutional Plan*.

*POLICIES AND PRINCIPLES

ES&H Policy

Sandia has adopted the following corporate ES&H policy: Sandia National Laboratories considers the protection and preservation of the environment and the safety and health of its [employees](#), [contractors](#), [visitors](#), and the public to be critical to its success.

Concern and conduct in matters pertaining to the environment, safety, and health are the responsibility of all SNL employees, contractors, and visitors. **No job is more important than our health, our safety, and the protection of our environment.**

Integrated Safety Management System (ISMS)

Sandia's ES&H Program adheres to the approach described in CPR400.1.2, *Sandia's Integrated Safety Management System (ISMS) Description*, [Section 2.1](#), "Objectives, Safety Management Functions, and Guiding Principles."

The ES&H Program comprises distinct functional areas within the structure of Sandia's ISMS. See [Attachment 1B-1](#), "Site Premises Chart."

CONSEQUENCES AND LIABILITIES

Legal Obligation

It is in the best interests of Sandia National Laboratories to be viewed as a safe, environmentally sensitive corporation, and good neighbor. However, compliance with federal, state, and local ES&H requirements is not just good business, it is the law. Civil and criminal liabilities exist that create external accountability.

ES&H obligations for "All Members of the Workforce," "Minors," and "Roving Personnel

and Visitors," are described in [Section 1D](#), "Who Does What."

For information on obligations for contracted work, see the [Contractor Training Instructional Aid](#) and [Section 4V](#), "ES&H for Contracted Construction and Construction-Like Activities."

Sandia Employees

Generally, civil liabilities are assessed against Sandia Corporation, not against individual employees. However, if a third party brings a civil action directly against a Sandia employee, the Corporation protects the employee from assessed penalties **as long as the employee was acting within the scope of his or her employment, in good faith, and in the best interests of the Corporation**. If an employee acts outside the scope of his or her employment, or knowingly or willfully violates a law applicable to Sandia, the Corporation is not obligated to protect or defend that employee.

All Sandia employees are also subject to internal discipline. See [CPR300.4.3](#), *Employee Conduct and Corrective Discipline* for more information.

Contractors

[Contractors](#) are subject to the disciplinary procedures of their employer (the contracting company). Managers directing work performed by contractors should notify the [Sandia delegated representative \(SDR\)](#) or the [Sandia contracting representative \(SCR\)](#) about ES&H performance issues. The SDR or SCR will contact the contracting company about addressing those issues.

Sandia Corporation and the Sandia Legal Division have no responsibility to represent or defend contractors. Employees of contracting companies must look to their own company and attorney for representation.

*REFERENCES

Requirements Source Documents

[DE-AC04-94AL85000](#), *Management and Operating Contract Between Sandia Corporation and DOE.*

SNL, [CPSR400.1](#), *ES&H Policy Statement Requirement*

Implementing Documents

SNL, [CPR001.2.1](#), *Setting the Standard - Code of Ethics and Business Conduct.*

SNL, [CPR300.4.3](#), *Employee Conduct and Corrective Discipline.*

SNL, [CPR400.1.2](#), *Sandia National Laboratories' Integrated Safety Management System (ISMS) Description.*

Related Documents

SNL, [Contractor Training Instructional Aid](#).

SNL, [Sandia Strategic Plan 1997](#).

SNL, [Sandia Institutional Plan](#).



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ES&H Manual

SECTION 1C – HOW ES&H IS IMPLEMENTED


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- 
- [Applicability](#)
 - [*Requirements Management](#)
 - [Implementation Process](#)
 - [*References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
 - Sandia contractors as specified in [Section 1B](#), "What Is the Scope."
-



*REQUIREMENTS MANAGEMENT

Process Summary

All ES&H requirements are:

- Identified, accepted (or determined to be not applicable to SNL), and communicated to Members of the Workforce.
- Tracked from receipt through implementation.
- Monitored for compliance and effectiveness of implementation.

How Requirements are Identified and Accepted

Laws and Regulations

The Legal Division is responsible for identifying all federal, state, and local laws, regulations, and ordinances with which Sandia shall comply, and for communicating those requirements within Sandia. For more information on identifying legal requirements, see CPR400.1.2, *Integrated Safety Management System (ISMS) Description*, Section 2.6.1, "Identify Standards and Requirements."

DOE Directives

DOE directives come into Sandia through the Contract Management Department (CMD) in the Contracts Center. Directives, or applicable portions thereof, are assigned to [responsible individuals \(RIs\)](#) for program-level implementation of specific technical requirements contained in the directive. RIs may delegate authority to interpret, implement, and assess compliance with technical requirements to a functional manager and/or [subject matter experts \(SMEs\)](#). Any program-level requirements are negotiated with DOE at the time of acceptance.

IMPLEMENTATION PROCESS

How Requirements are Implemented

After a new ES&H requirement is determined to be applicable to Sandia, the requirement and program-level information on how to implement it are communicated to all Members of the Workforce through Sandia's ES&H document hierarchy, which is

summarized in the following table.

SNL ES&H Document Hierarchy			
Level	Document(s)	Purpose	Audience
External directives	DE-AC04-94AL85000 , <i>Management and Operating Contract Between Sandia Corporation and DOE</i>	Establish the contractual basis for compliance with laws and directives.	DOE and Sandia management
Corporate policy	CPS400.1 , <i>Environment, Safety and Health Policy Statement Requirement</i>	Define Sandia's ES&H policy.	All Members of the Workforce
Corporate process requirements	CPR400.1.2 , <i>Integrated Safety Management System (ISMS) Description</i>	Define the strategy for achieving policy objectives.	DOE and Sandia management
	CPR400.1.1 , <i>ES&H Manual</i> and supplements	Describe general ES&H requirements, instructions, and responsibilities.	All Members of the Workforce
Business unit information	ES&H technical work documents (TWDs) (see Chapter 21 , "Technical Work Documents [TWDs]," for more information)	Identify hazards specific to work activities and provide instructions for mitigating those hazards.	SNL Members of the Workforce who perform the activity



ES&H program documents (as necessary)

Define the scope, objectives, requirements, interfaces, and roles and responsibilities for specific ES&H programs.

Program owners and [subject matter experts \(SMEs\)](#)

Sandia's implementation process for all work can be related to the following safety management functions:



Each of these functions is described in detail in CPR400.1.2, *Sandia National Laboratories' Integrated Safety Management System (ISMS) Description*, [Sections 2.4](#) through 2.8. For more information, see [Chapter 2](#), "Cross-Cutting ISMS Elements," and [CPR001.3.4](#), *The Corporate Work Process (CWP)*.



*REFERENCES

Requirements Source Documents

[DE-AC04-94AL85000](#), *Management and Operating Contract Between Sandia Corporation and DOE.*

Implementing Documents

SNL, [CPS400.1](#), *Environment, Safety and Health Policy Statement Requirement.*

SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description.*

Related Documents

SNL, [CPR001.3.4](#), *The Corporate Work Process (CWP)*



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ES&H Manual

CHAPTER 2 – OVERVIEW


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- 
- [*Applicability](#)
 - [General Information](#)
 - [*References](#)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This chapter and all of its subsections apply to all Members of the Workforce.

GENERAL INFORMATION

This chapter describes the elements of Sandia's [Integrated Safety Management System \(ISMS\)](#) that cut across all ES&H programs. It is organized around the five core safety management functions of ISMS. These include:

- [Section 2A](#), "Plan Work"
- [Section 2B](#), "Analyze Hazards"
- [Section 2C](#), "Control Hazards"
- [Section 2D](#), "Perform Work"
- [Section 2E](#), "Feedback and Improve"

This chapter serves as a "road map" to other portions of the *ES&H Manual* and related information located on Sandia's Internal Web. Descriptions are generally brief and high-level, with cross-references provided in each section to sources of additional information and detail.

It should be noted that the application of cross-cutting elements is not necessarily dependent on the section or order in which they are presented in this chapter. Implementation of any cross-cutting element should include impact considerations on all five safety management functions.

It should also be noted that the term "safety" as used in this chapter has the same meaning as "integrated safety management." In this context, "safety management" refers to a combination of environment, safety, and health management. It does **not** mean "safety engineering" as it relates to an ES&H program.

For a full understanding of Sandia's ISMS structure in the context of laboratory management, see [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*, and [CPSR001.3](#), *Integrated Laboratory Management System*.

*REFERENCES

Implementing Documents



SNL, [CPR400.1.2](#), *Integrated Safety Management System (ISMS) Description*.

[Sandia National Laboratories Environment, Safety and Health Assurance System Description](#).

Related Documents

SNL, [CPSR001.3](#), *Integrated Laboratory Management System*.



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*SECTION 19F – OTHER WASTE

Subject Matter Expert: [David Castillo](#); CA Counterparts: [Janet Harris](#) and [Lauren Farren](#)
MN471001, Issue C
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- [*Applicability](#)
- [Commercial Solid Waste](#)
- [Construction and Demolition Debris](#)
- [Asbestos Waste](#)
- [*Beryllium-Contaminated Waste](#)
- [*Infectious Waste](#)
- [*Industrial Solid Waste](#)
- [Other Special Waste](#)
- [Related Hazards and Activities](#)
- [References](#)
- [*Attachment](#)
 - [19F-1](#), Certification of Noninfectious Material

*APPLICABILITY


For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

Requirements and guidance for Members of the Workforce at SNL/CA are contained in [CPR400.1.1.37/GN470075](#), "[Guidelines for Waste Generators](#)."

This section applies to all Members of the Workforce on [Sandia-controlled premises](#) and to all

Members of the Workforce involved in activities on [Sandia-controlled premises](#) within the State of New Mexico that generate, manage, accumulate, or request disposal of the following waste types:

- 
- [Commercial solid waste](#)
 - [Construction and demolition debris](#)
 - [Asbestos waste](#)
 - [Infectious waste](#)
 - [Industrial solid waste](#)
-


COMMERCIAL SOLID WASTE



Requirements

Members of the Workforce shall place [commercial solid waste](#) in trash cans, waste receptacles, or dumpsters that are used for commercial solid waste collection. They should be closed, except when waste is being added. Trash cans, waste receptacles, or dumpsters shall be reasonably clean to prevent the harboring of insects and rodents.

Members of the Workforce shall **not**:

- 
- Mix commercial [solid waste](#) with any other type of waste.
 - Burn or incinerate commercial solid waste.
 - Place any of the following types of waste in trash cans, waste receptacles, or dumpsters:
 - Hazardous waste (see [Section 19A](#), "Hazardous Waste Management").
 - [Radioactive waste](#) (see [Section 19B](#), "Low-Level Radioactive Waste Management").
 - Mixed waste (see [Section 19C](#), "Mixed Waste Management").
 - "Radioactive Waste," "Mixed Waste," or "Radioactive" labels.
 - Wood or metal (e.g., pallets, conduit, rebar).
 - [Sludge](#).

- Waste containing free liquids.
- Bulk liquids or containers containing liquids.
- Ammunition.



Guidance

Note: See [Section 4P](#), "Housekeeping" for information about recycling paper and cardboard.

Members of the Workforce should consult the appropriate [Division ES&H Team](#) environmental representative if they have questions about waste identification, management, and disposal.

CONSTRUCTION AND DEMOLITION DEBRIS

Requirements



Note: [Construction and demolition debris](#) is usually generated by construction, demolition, or remodeling activities and is coordinated by SNL's [Facilities](#) organization.

Managers shall be responsible for ensuring that:

- If construction and demolition debris needs to be managed and/or disposed of by a non-Facilities organization, the appropriate [Division ES&H Team](#) environmental representative is consulted.
- Construction and demolition debris is **not**:
 - Mixed with any other types of [solid waste](#).
 - Disposed of in dumpsters.




Guidance

Members of the Workforce should consult [Telecon Plus](#) (Facilities Services) when facility modifications or installations are needed, or see [Section 4V](#), "ES&H for Line-Managed Contracted Construction and Construction-Like Activities," for more information.

ASBESTOS WASTE

Facilities Related Asbestos




Note: Most [asbestos waste](#) is associated with building materials and is used for its thermal insulating and binding properties. Asbestos waste is typically generated during construction, demolition, or renovation activities and is managed by the [Facilities Asbestos Implementation Team \(FAIT\)](#).

Requirements

Members of the Workforce, other than the FAIT, shall **not** disturb any asbestos-containing materials (ACMs) associated with building systems.

Non-Facilities Related Asbestos

Requirements




Members of the Workforce shall consult the FAIT for proper disposal instructions when equipment with non-Facilities related ACM is declared waste.

Note: ACM waste shall **not** be stored for more than 45 days on [Sandia-controlled premises](#) within the State of New Mexico.

Note: Members of the Workforce shall dispose of personal non-facilities asbestos items, such as gloves, hot pads, or other small asbestos-containing items or equipment by using the [Waste Description & Disposal form \(WDDR\)](#).

*BERYLLIUM-CONTAMINATED WASTE

Requirements



Note: Although beryllium is not regulated as a hazardous waste, beryllium dust has been identified as an inhalation hazard (See CPR400.1.1/MN471001, *ES&H Manual*, [Chapter 6](#), "Industrial Hygiene.") Accordingly, beryllium-containing waste, beryllium-contaminated equipment, and other items shall **not** be discarded in dumpsters or regular trash.

Members of the Workforce who are owners or generators of any waste, equipment, or other items to be disposed of which are contaminated with or contain beryllium shall:

- Use sealed impermeable bags, containers, or enclosures to prevent the release of beryllium

dust during handling and transportation.

- Double bag the waste, equipment, or item when using plastic bags.

- Label the bags, containers, and enclosures used for disposal of beryllium with the following text:



DANGER
CONTAMINATED WITH BERYLLIUM
DO NOT REMOVE DUST BY BLOWING OR
SHAKING
CANCER AND LUNG DISEASE HAZARD

- Follow the requirements contained in Section 19A, "Hazardous Waste Management" if the beryllium waste also contains hazardous waste.
 - Contact the appropriate [Division ES&H Team](#) environmental protection representative for specifics regarding hazardous waste.
- Submit all beryllium-containing waste for disposal using the electronic "Waste Description & Disposal Request" ([WDDR](#)) form.

Note: This material will not be picked up for disposal unless it is properly contained and marked.

*INFECTIOUS WASTE

Requirements

Members of the Workforce who generate waste shall determine if the waste meets the definition of [infectious waste](#).

Guidance

Members of the Workforce should consult the appropriate [Division ES&H Team](#) environmental protection representative for assistance in making this determination.

INFECTIOUS WASTE CONTAINMENT, MARKING, AND STORAGE

Requirements

Containment



Members of the Workforce shall:

- Contain infectious waste in a manner and location which:
 - Prevents animal intrusion.
 - Does not provide a breeding place or a food source for insects and rodents.
 - Minimizes exposure to the public.
- Segregate infectious waste from other waste at the point of generation through separate containment.
- Place only infectious waste in a red infectious waste container.



● Reuse rigid infectious waste containers for infectious or non-infectious waste if:

- They are thoroughly washed and decontaminated each time they are emptied, and
- The surfaces of the containers have been completely protected from contamination by:
 - Disposable, unpunctured or undamaged liners, bags, or
 - Other devices that are removed with the infectious waste, and
 - The surface of the containers have not been damaged or punctured.
- Contain infectious waste in plastic containment bags, inside rigid containers, except for sharps.
 - Securely close or tie the bags to prevent leakage or expulsion of wastes during storage, handling, or transport.



● Contain sharps in containers which are manufactured for the purpose of sharps containment and are:

- Leak-proof.
- Rigid.
- Puncture-resistant.

- Tightly lidded or taped closed to prevent loss of contents.

Marking

Members of the Workforce shall:

- Clearly identify plastic containment bags.
 - Use red or orange bags.
 - Mark the bag with the word "BIOHAZARD" in letters large enough to be read at a minimum distance of five feet.
- Ensure that rigid containers of infectious waste shall be:
 - Marked as "biomedical waste" or
 - Otherwise conspicuously labeled as holding infectious waste and
 - Are red or orange in color.
- Place only infectious waste in an infectious waste container.

Storage

Members of the Workforce shall:

- Protect infectious waste from the elements in storage and containment areas which:
 - Are ventilated to the outdoors.
 - Are accessible only to authorized persons.
 - Are marked with prominent warning signs on, or adjacent to, the exterior doors or gates that state "Infectious Waste Storage." The warning signs shall be easily read during daylight from a distance of 25 feet.

Members of the Workforce who generate infectious waste that contains free liquids shall:

- Place an absorbent material inside the liner of the rigid container equal to one cup of absorbent material per six cubic feet of box area if:
 - The rigid container is to hold any containers which had held free liquids.
 - If the rigid container is to hold containers of free liquids, then enough absorbent material

shall be placed inside the liner of the rigid container sufficient to absorb 15% of the total volume of free liquids inside the rigid container.

- **Not** use compactors, grinders or similar devices to reduce the volume of infectious waste before the waste has been rendered non-infectious unless prior approval has been obtained through your ES&H Support Team EP Representative.



Guidance

Members of the Workforce may choose to render infectious waste non-infectious according to the requirements for Rendering Infectious Waste Non-Infectious below.

DISPOSAL OF INFECTIOUS WASTE

Requirements

Members of the Workforce shall choose one of two methods for disposing of infectious waste:

- Submit infectious waste on a WDDR for transportation to an approved incineration facility, or
- Sterilize infectious waste according to the requirements for Rendering Infectious Waste Non-infectious below.



Note: Identify other hazards that may be associated with the infectious waste when requesting disposal.

Members of the Workforce shall not render the following infectious waste non-infectious and shall only submit it for disposal on a WDDR:

- Infectious waste consisting of recognizable human anatomical remains.
- Infectious waste contaminated with hazardous and/or radioactive substance or waste.

RENDERING INFECTIOUS WASTE NON-INFECTIOUS

Requirements



Members of the Workforce who render infectious waste non-infectious by sterilization shall sterilize infectious waste by heating in a steam sterilizer (autoclave) according to the requirements in CPR400.1.1/MN471001, *ES&H Manual*, [Section 6N](#)) of the ES&H manual and comply with the following requirements.

- Prepare and maintain on file, a management plan that identifies the following:

- Type of waste generated and handled.
 - Segregation.
 - Packaging.
 - Labeling.
 - Collection.
 - Storage.
 - Implemented transportation procedures.
 - Treatment or disposal methods.
 - Person responsible for the management of the infectious waste at the point of generation.
- Report immediately upon recognition:

- Delivery of any unauthorized waste.
- Contamination of any person with infectious waste.
- Other emergencies.

Note: In addition to complying with the reporting requirements in Chapter “Occurrence Reporting,” in section [18C](#), any of Report the above occurrences shall be reported to the Secretary of the New Mexico Environment Department by contacting the Subject Matter Expert (SME) of this section or their SME's Department Manager in the SMEs is absence.

Members of the Workforce shall meet the following requirements:

- The operator shall have operating procedures for each steam sterilizer and shall certify in writing that she or he understands the written operating procedures, including:
 - Time.
 - Temperature.
 - Pressure.
 - Type of waste.

- Type of container(s).
- Closure on container(s).
- Pattern of loading.
- Water content.
- Maximum load quantity.



- Infectious waste shall be subjected to sufficient temperature, pressure, and time:
 - To kill *Bacillus stearothermophilus* spores.
 - Or induce a complete color change in an approved steam sterilization integrator when indicator is located in the center of the waste load being decontaminated.
- Attach temperature sensitive tape or equivalent test material such as chemical indicators to each package of infectious waste to be sterilized to indicate if the sterilization temperature and pressure have been reached, *unless a steam sterilizer is equipped to continuously monitor and record temperature and pressure during the entire length of each sterilization cycle.*



- Waste shall not be considered sterilized if the tape or equivalent indicator fails to indicate that a temperature of at least 250 degrees Fahrenheit or 121 degrees Celsius was reached during the process.
- Evaluate each sterilization unit at least once each 40 hours of operation by:
 - Demonstrating its effectiveness to kill *Bacillus stearothermophilus* spores or
 - Using an approved steam sterilization integrator.
- Maintain a written log for each sterilization unit which contains:
 - Date.
 - Time.
 - Load number for each load.
 - Amount per load.
 - Duration of the cycle.
 - Operator's name.



- Certify the sterilization in writing by completing [Attachment 19F-1](#) “Certification of Noninfectious Material” each time sterilization is performed.
- Submit the sterilized waste on a WDDR and provide a copy of the certification with the WDDR.
 - Maintain the original copy of the certification in the files.



*INDUSTRIAL SOLID WASTE

Requirements

Members of the Workforce who generate waste shall:

- Determine if the solid waste they generate is identified as or meets the definition of [industrial solid waste](#).

Note: [Consult a Division ES&H Team](#) environmental protection representative for assistance in making this determination.

- Determine and document the physical and chemical characteristics of industrial solid waste prior to its storage or disposal (contact the Division ES&H Team environmental protection representative for assistance).
- Only dispose of industrial solid waste in dumpsters that are:
 - Approved by the [SME](#).
 - Marked as “Special Waste Only” with the following information:
 - Date the container was filled.
 - Container contents.
 - Potential health, safety, and environmental hazards associated with the waste.

Note: Industrial solid waste is a subset of New Mexico special waste and is prohibited from disposal in dumpsters for commercial solid waste. Contact the Division ES&H Team environmental protection representative for assistance.

Guidance

Members of the Workforce should review Figure 1. "Industrial Solid Waste Decision Flowchart," to determine whether industrial solid waste may be generated as a result of any of their [manufacturing](#) or [industrial](#) processes.

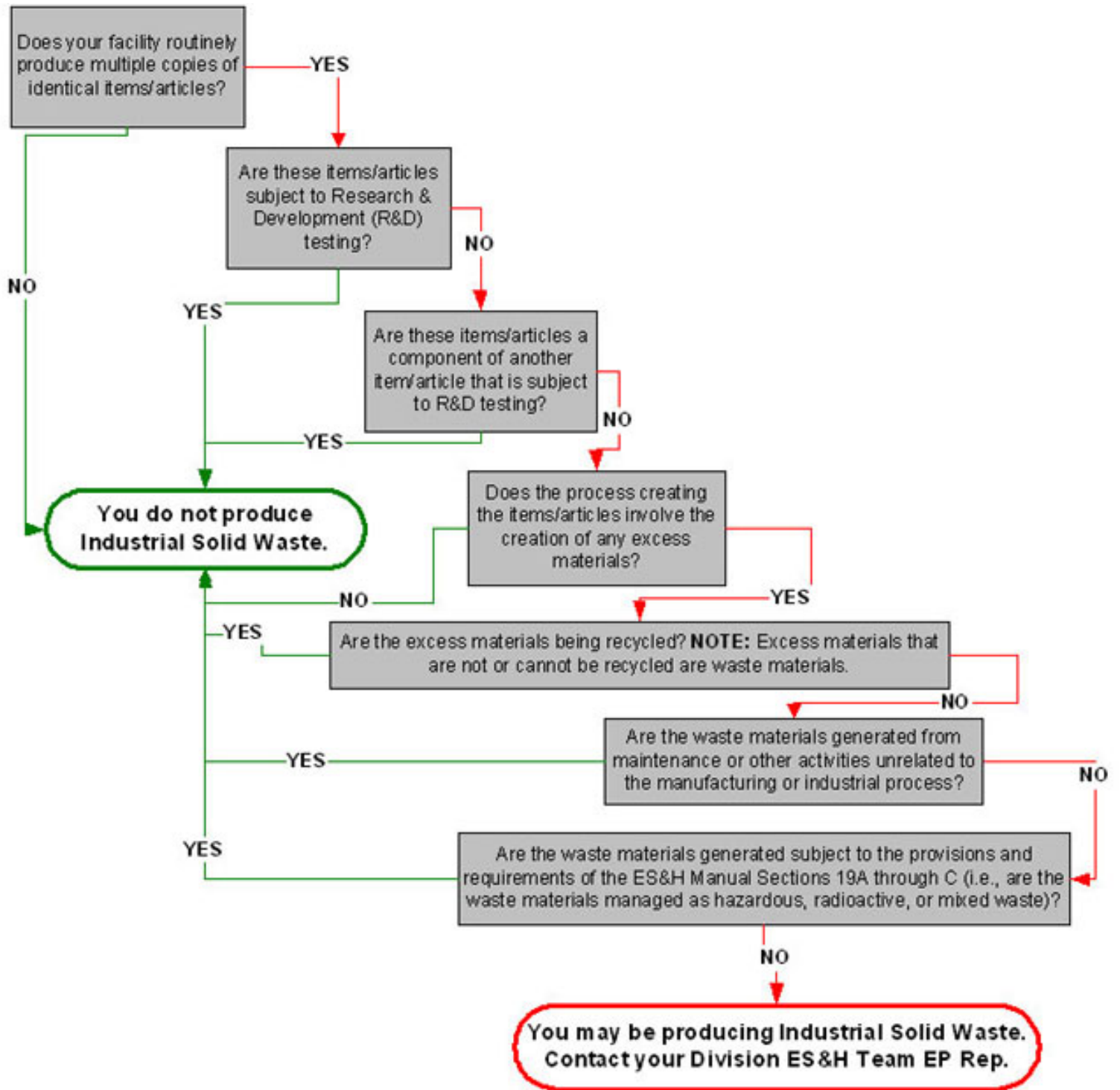


Figure 1. Industrial Solid Waste Decision Flowchart

Management and Disposal Requirements

Managers shall ensure that:

- Industrial solid waste is stored only at an approved special waste storage area.

Note: Consult the [Division ES&H Team environmental protection representative](#) for assistance in establishing an approved special waste storage area.

- Industrial solid waste storage does not exceed 45 days from the date the waste was generated.

- Containers of industrial solid waste shall be clearly marked with the following information:
 - Date the container was filled.
 - Container contents.
 - Potential health, safety, and environmental hazards associated with the waste.

OTHER SPECIAL WASTE

Requirements

Members of the Workforce shall consult the appropriate [Division ES&H Team](#) environmental protection representative for requirements before beginning any activities that have the potential to generate the following special wastes:

- [Sludge](#)
- Treated waste that was formerly characterized as hazardous waste
- A spill of a chemical substance or commercial product that is **not** being managed as a hazardous or radioactive waste
- Dry chemicals, that when wetted can become characteristically hazardous, that are **not** being managed as a hazardous or radioactive waste
- Petroleum-contaminated soils

Note: These special wastes shall **not** be stored for more than 45 days on [Sandia-controlled premises](#) within the State of New Mexico.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to "other wastes" include:

Hazard/Activity	Reference
Asbestos	Section 6B , "Asbestos."
Environmental protection	Chapter 10 , "Environmental Protection."
Chemical exchange	Section 6U , "Hazardous Material (Chemical and Biological) Inventory"
Chemical handling	Section 6D , "Hazard Communication Standard." Section 6E , "Laboratory Standard - Chemical Hygiene Plan."
Chemical spills	Section 10E , "Chemical Spills."
Handling materials or waste that has a potential for occupational exposure to bloodborne pathogens	Chapter 16 , " Health, Benefits, and Employee Services ." CPR400.1.1.19/GN470086 , <i>SNL Bloodborne Pathogens Exposure Control Plan</i> .
Hazardous waste	Section 19A , "Hazardous Waste Management."
Household waste	Section 4P , "Housekeeping."
Lead bank	Section 10L , "Management of Excess Metallic Lead ."
Low-level radioactive waste	Section 19B , "Radioactive Waste Management."
Mixed waste	Section 19C , "Mixed Waste Management."
Radioactive material management areas (RMMAs)	Section 19D , "Radioactive Material Management Areas (RMMAs)."
Recycling	Section 4P , "Housekeeping." CPR 500.2.3 , <i>Property/Assets User's Manual</i> , " Identifying and Handling Excess Property ."

Recyclable material, including <ul style="list-style-type: none"> ● Batteries ● Light bulbs ● Scrap solder ● Toner cartridges 	Section 19A , "Hazardous Waste Management."
Rodent carcass removal and rodent feces cleanup	Section 6N , "Biological Agents and Biosafety."
Treatability studies for hazardous and mixed waste	Section 19E , "Treatability Studies for Hazardous and Mixed Waste."
Waste concerns at SNL/CA	CPR400.1.1.37/GN470075 , <i>Guidelines for Waste Generators at SNL/CA.</i> CPR400.1.1.24/GN470094 , <i>Handling Chemicals at SNL/CA.</i>

REFERENCES

Requirements Source Documents

[20 NMAC 9.1](#), *New Mexico Solid Waste Management Regulations*, New Mexico Administrative Code, State of New Mexico Environment Department (NMED).

Implementing Documents

SNL, [CPR400.1.1.19/GN470086](#), *SNL Bloodborne Pathogens Exposure Control Plan.*

SNL, *Standard Specification*, Section 01065, "Environment, Safety and Health Requirements."

Related Documents

SNL, [PG470185](#), *Waste Management.*

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ES&H Manual

CHAPTER 4 – INDUSTRIAL SAFETY

MN471001, Issue BW

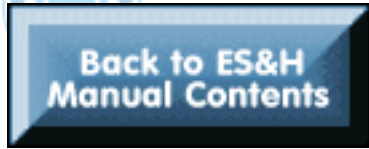
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Administrative Changes: May 15, 2007, June 13, 2007, and [July 2, 2007](#)

* Indicates a substantive change

- [Section 4A](#) - Working in High-Injury-Potential/Remote Operations
- [Section 4B](#) - Electrical Safety Practices
- [Section 4C](#) - Lockout/Tagout
- [Section 4D](#) - Pressure Safety Operations
- [Section 4E](#) - Hot Work Safety
- [Section 4F](#) - Ladders, Scaffolds, and Elevating Work Platforms
- [Section 4G](#) - Fall Prevention/Fall Protection
- [Section 4H](#) - Excavations, Trenches, and Floor or Wall Penetrations
- [Section 4J](#) - Material Handling - Cranes, Hoists, and Forklifts
- [Section 4K](#) - Traffic Safety
- [Section 4L](#) - Personal Protective Equipment (PPE)
- [Section 4M](#) - Signs (Including SWHAS) and Tags
- *[Section 4N](#) - Industrial Machine and Portable Power Tool Safety
- [Section 4P](#) - Housekeeping
- [Section 4R](#) - Light and Heavy Earth Moving Equipment

- [Section 4S](#) - Use of Powered Carts
- [Section 4T](#) - Firearms Safety
- [Section 4U](#) - Aviation Safety
- [Section 4V](#) - ES&H for Contracted Construction and Construction-Like Activities
- [Section 4W](#) - Asphyxiating Environments



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ES&H Manual

SECTION 4M - SIGNS (INCLUDING SWHAS) AND TAGS


Subject Matter Expert: [Willie J. Johns](#); CA Counterparts: [Herman Armijo](#)

MN471001, Issue C

Revision Date: [December 16, 1998](#), Replaces Document Dated: July 31, 1995

Administrative Changes: November 9, 2004 and [June 14, 2006](#)

* Indicates a substantive change

- 
- [*Applicability](#)
 - [*Sign and Tag Use](#)
 - [*Related Hazards and Activities](#)
 - [*References](#)
 - Attachments
 - [*4M-1](#) - Sandia Workplace Hazards Awareness System (SWHAS)
 - [*4M-2](#) - ISMS Hazard Notice Sign
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- 
- Sandia employees.

 - Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all Members of the Workforce whose activities involve the use of

signs and tags.

*SIGN AND TAG USE

Requirements

Space owners (see "Space Ownership and Use" in [Section 1D](#), "Who Does What") shall be responsible for:

- Using [signs](#) and/or [tags](#) as a visual means of warning individuals, Members of the Workforce and visitors, of the presence of a hazard, the potential for a hazard, or to convey safety instructions necessary to avoid injury. Contact the appropriate [Division ES&H Team](#) for assistance in identifying, evaluating, and controlling hazards.
- Ensuring that signs and tags are conspicuously posted and maintained where hazards are present (see "[Related Hazards and Activities](#)" for assistance in determining the appropriate signs).
- Ensuring that space ownership designations are changed to reflect the new owner when their space is transferred to another line organization or reverts to Facilities ownership (see the [space management](#) contact).
- Changing signs to accurately reflect the physical or health hazards inherent to the space.

Space owners shall follow the requirements of MN471016, *Radiological Protection Procedures Manual*, [Chapter 2](#), "Posting and Labeling for Radiological Control," for radiological posting at SNL.

Space owners **shall not** use signs, tags, or other warning devices as the sole method for mitigating a hazard.

The purpose of these devices is to provide a visual means of informing the observer of the hazard, the degree of hazard and the appropriate actions to be taken to avoid injury. This process uses a hazard alert system consisting of three different signal words,

specific color coding designations and signal word configurations. Color specifications for these signs shall meet the requirements in ANSI Z535.1, *Safety Color Code*, table 1.

Danger Signs

Space owners shall use danger signs only where an immediate hazard exists which could result in death or serious injury.

Danger signs have red as the predominating color for the upper panel, black outline for the border, the signal word "DANGER" depicted in white, and a white lower panel for additional sign wording. Black or red lettering shall be used for additional wording to specify the hazard and to denote what special precautions are necessary. See Figure 1.

Note 1: Use of the danger sign is to be limited to the most extreme situations.

Note 2: Danger signs are not appropriate for property damage hazards unless personal injury risk appropriate to this level is also involved.



Figure 1. Danger Sign

Warning Signs

Space owners shall use warning signs to indicate a potentially hazardous situation that, if not avoided, could result in death or serious injury. Warning signs are not appropriate for property damage hazards unless personal injury risk appropriate to this level is also involved.

Warning signs have orange as the predominating color for the upper panel, black outline for the border, the signal word "WARNING" depicted in black, and an orange lower panel for additional sign wording. Black lettering shall be used for additional wording to specify the hazard and to denote what special precautions are necessary. Alternately, the signal word "WARNING" depicted in black may appear on the upper portion of an orange field.

Caution Signs

Space owners shall use caution signs to warn against potential hazards that if not avoided could result in minor to moderate injury. Additionally, caution signs may be used to alert individuals against unsafe practices.

Caution signs have yellow as the predominating color, black upper panel with the signal word "CAUTION" depicted in yellow and the lower yellow panel for additional sign wording. Black lettering shall be used for additional wording to specify the hazard and to denote what special precautions are necessary or personal protective equipment is required. See Figure 2.

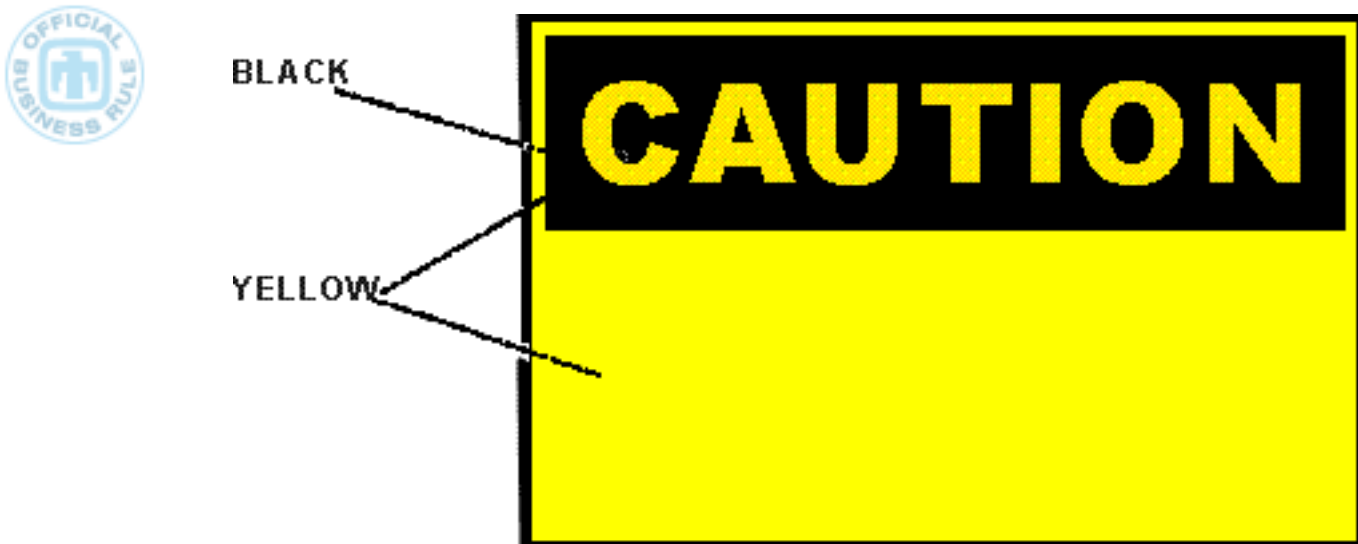


Figure 2. Caution Sign

Exit Signs

Space owners shall be responsible for ensuring:

- exits are marked by a readily visible sign.
- exit signs are distinctive in color, suitably illuminated, and contrast with

decorations, interior finishes or other signs.

Exit signs must have legible red letters on a white field, with the lettering not less than 6 inches high, and the principal stroke at least 3/4 inch in width. Contact the appropriate [Division ES&H Team](#) for assistance in determining requirements for posting exit signs.

Safety Instruction Signs

Space owners shall use safety instruction signs where there is a need to indicate general instructions and suggestions relative to safety measures.

Safety instruction signs are white with a green upper panel having white letters to convey the principal message. Black lettering shall be used for additional wording, i.e. directions, on the white panel.

Notice Sign

Space owners shall use notice signs to indicate information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

These signs shall have the signal word "NOTICE" in white letters on a blue background on a rectangular field, and this distinctive panel shall be located in the uppermost portion of the visual alerting device. No other signal word or symbol shall be used within this distinctive shape and color arrangement.

NFPA 704 Diamond

Space owners shall be responsible for posting the National Fire Protection Association (NFPA) Hazardous Materials Classification symbol, NFPA 704, as appropriate. Contact the appropriate [Division ES&H Team](#) for assistance in determining requirements for posting the NFPA 704.

The NFPA 704 system is used to safeguard the lives of those individuals who respond to emergencies in areas where the hazard of the materials are not readily apparent. Additionally, it provides a mechanism of alerting individuals, including visitors, of those chemical hazards within the space.

Note: CA does not post the 704 as part of the SWHAS or ISMS hazard notice, but as a separate posting, such as the UNO fire division symbol for explosive. The sign used in

CA is 10" x 14" with an NFPA diamond 5"x 5" with 1 1/2" (H) numbers. The purpose is to allow the responder to safely identify the hazards at a point of 50 ft or 33 meters.

Sandia Workplace Hazards Awareness System (SWHAS)

Space owners at SNL/NM shall place a SWHAS sign (see [Attachment 4M-1](#)) in laboratory, research, or production areas where potential physical and health hazards may exist.

ISMS Hazard Notification System (SNL/CA ONLY)

Space owners at SNL/CA shall post an ISMS Hazard Notice Sign ([Attachment 4M-2](#)) to effectively communicate the physical and health hazards that are present within a lab or work space, or are associated with a process or activity. The design, application, and use of the ISMS sign provides a means of indicating, defining, and designating specific hazards and to specify special precautions that are to be used to prevent accidental injury.

Accident Prevention Tags

Space owners shall use accident prevention tags (see Figure 3) only as a temporary means of warning individuals, Members of the Workforce and visitors of an existing temporary hazard, such as defective tools or equipment.

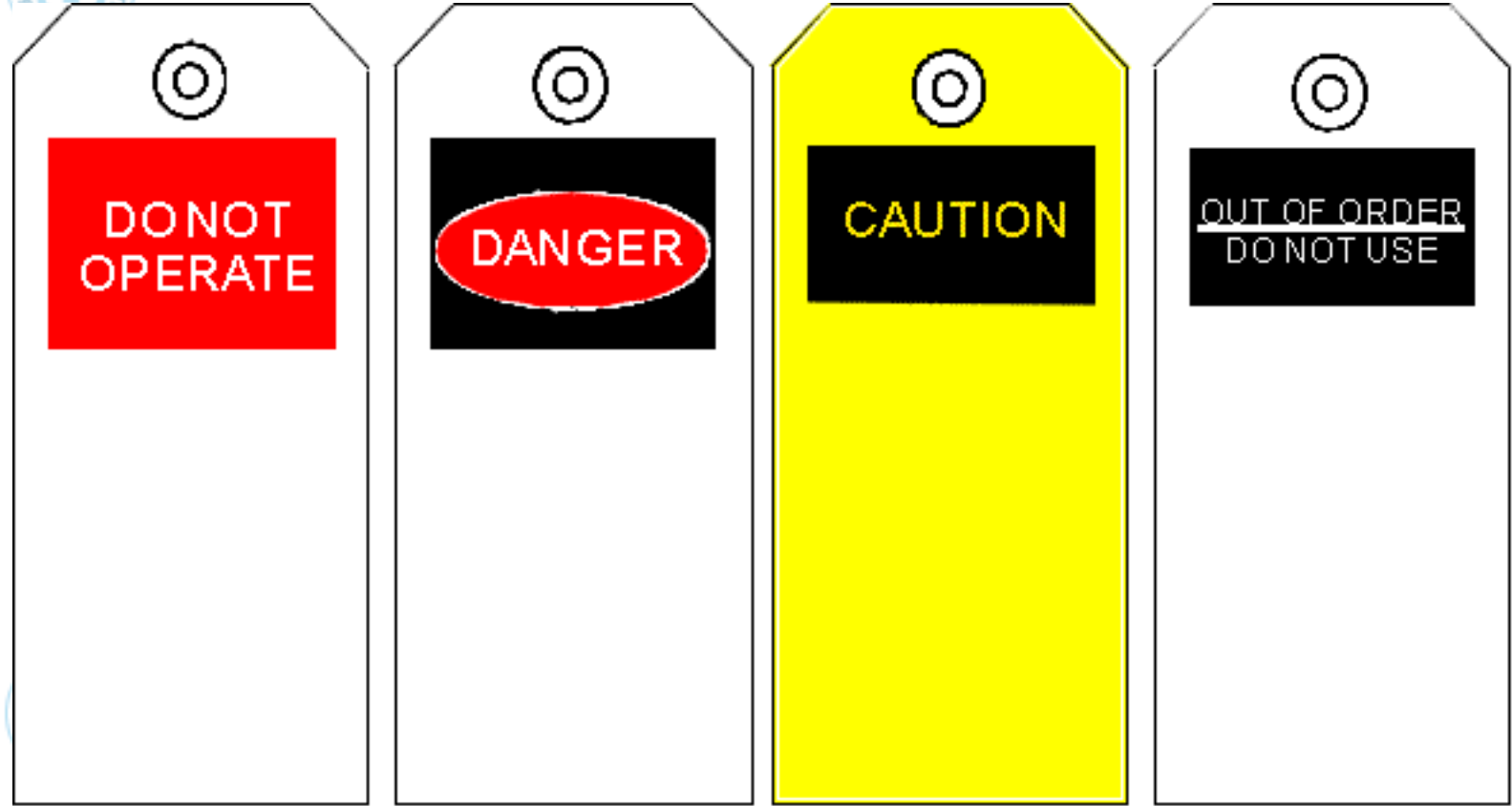
Space owners **shall not** use accident prevention tags in place of, or as a substitute for, designated accident prevention signs.

Accident prevention tags shall:

- Contain a signal word and major message.
- Use the signal word "DANGER", "CAUTION", or "BIOHAZARD" or the phrase "DO NOT OPERATE," "OUT OF ORDER - DO NOT USE," or the biological hazard symbol.
- Contain a major message indicating the specific hazardous condition or instructions to be communicated to the employee.
- Be readable at a minimum distance of five feet or such greater distance as

warranted by the hazard.

- Present the major message in pictograph and/or written form.
- Be affixed as close as safely possible to the respective hazard by a positive means which prevents their loss.



White Tag - White Letters on Red Square

White Tag - White Letters on Red Oval With a Black Square

Yellow Tag - Yellow Letters on a Black Background

White Tag - White Letters on Black Background

Basic Stock (Background)	Safety Colors (ink)	Copy Specification (Letters)
White	Red	Do Not Operate
White	Black and Red	Danger
Yellow	Black	Caution
White	Black	Out of Order Do Not Use



Figure 3. Accident Prevention Tags

Guidance

Members of the Workforce should:

- See the [Traffic Safety Committee](#) contact for information about traffic signs or to make recommendations for placing or removing traffic signs.
- Use a UV cover on outdoor signs to reduce the damaging effects of the sun, such as fading and cracking or purchase signs which are manufactured from UV resistant materials.



*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [signs](#), signals, and [tags](#) include:

Hazard/Activity	Reference
Engineering Controls - Installation, management and maintenance of building controls	"Engineering Controls" in Section 2C , "Control Hazards"
Administrative Controls - Signage required by ES&H programs	"Administrative Controls" in Section 2C , "Control Hazards"
Labels - Guidance on labeling containers of hazardous material	"Administrative Controls" in Section 2C , "Control Hazards"
Construction hazards posting	"Administrative Controls" in Section 2C , "Control Hazards"
Personal protective equipment (PPE)	"Administrative Controls" in Section 2C , "Control Hazards"
Control Locking - Lockout/Tagout information	Section 4C , "Lockout/Tagout for the Control of Hazardous Energy"
Industrial hygiene labeling	Section 6D , "Hazard Communication Standard" Section 6E , Laboratory Standard - Chemical Hygiene Plan"

Electrical hazards posting	"Sign Requirements" in MN471004 , <i>Electrical Safety Manual</i> , Section 2.6, "Access to Electrical Equipment"
Radiological hazards posting	MN471016, <i>Radiological Protection Procedures Manual</i> , Chapter 2 , "Posting and Labeling for Radiological Control"
Biological hazards posting	GN470086 , <i>SNL Bloodborne Pathogens Exposure Control Plan</i> , Section 4.4, "Communication of Hazards"
Machinery or equipment that does not pass operational checks or that does not operate properly	"Out of Order" tag (Cat. No. 19-102-632)
Local exhaust ventilation (LEV) certification label	"Use Of Local Exhaust Ventilation (LEV) Equipment" in Section 6P , "Local Exhaust Ventilation (LEV)"
Continuous, unattended hazardous operation placard	"Continuous, Unattended Hazardous Tests Or Operations" Chapter 5 , "Fire Protection"
Traffic Signs	Traffic Safety Committee contact
Posting requirements for chemical handling at SNL/CA	GN470094 , <i>Handling Chemicals at SNL/CA</i>

*REFERENCES

Requirements Source Documents

[29 CFR 1910.34](#), "Means of Egress, General."

[29 CFR 1910.145](#), "Specifications for Accident Prevention Signs and Tags."

[29 CFR 1926.34](#), "Means of Egress."

[29 CFR 1926.200](#), "Accident Prevention Signs and Tags."

ANSI/NFPA 704-1996, Standard Systems for the Identification of the Fire Hazards of Materials.

ANSI Z53.1-1967, Safety Color Coding for Marking Physical Hazards and the Identification of Certain Equipment.

ANSI D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways.



*Implementing Documents

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

[29 CFR 1910.141](#), "Sanitation."

[DOE 5480.4](#), *Environmental Protection, Safety, and Health Protection Standards*, Attachment 2, "Mandatory ES&H Standard."

[DOE O 440.1](#), *Worker Protection Management for DOE Federal and Contractor Employees*. ANSI Z535.1-1998, Safety Color Code.



ANSI Z535.2-1991, *Environmental and Facility Safety Signs*.

ANSI Z535.5-1991, *Accident Prevention Tags (for Temporary Hazards)*.

NFPA 49, *Hazardous Chemical Data*.

NFPA 325M, *Fire Hazard Properties of Flammable Liquids, Gasses and Volatile Solids*.



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Chapter Contents





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ES&H Manual

SECTION 4R - LIGHT AND HEAVY EARTH MOVING EQUIPMENT


Subject Matter Expert: [Ernest Sanchez](#); CA Counterpart: [Herman Armijo](#)

MN471001, Issue D

Revision Date: [January 28, 1998](#), Replaces Document Dated: September 3, 1997

Administrative Changes: [April 2, 2004](#)


* Indicates a substantive change

- 
- [*Applicability](#)
 - [*General Requirements](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



his section applies to operations of various types of [light earth moving equipment](#) and [heavy earth moving equipment](#) at SNL/NM, SNL/CA, and TTR. At KTF, earth moving operations and equipment are the responsibility of the Navy.

*GENERAL REQUIREMENTS

Requirements

Equipment Operation

Operators shall be [authorized](#) and qualified to operate [light earth moving equipment](#) and [heavy earth moving equipment](#), and shall:

- Operate equipment according to operators' or manufacturers' instruction manuals and requirements in [GN470097](#), *Operating Light and Heavy Earth Moving Equipment*.
- Ensure personnel do not "ride" on equipment or receive a "ride or lift" from any bucket device at any time.
- Test brakes, park equipment, and handle nonemergencies and emergencies according to procedures in [GN470097](#), *Operating Light and Heavy Earth Moving Equipment*.
- Follow general safety requirements according to requirements in [GN470097](#), *Operating Light and Heavy Earth Moving Equipment*.

Training

Operators shall either:

- Be properly trained on each piece of equipment before operation. At a minimum, training shall address the following:
 - Operating characteristics
 - Capabilities and limitations
 - Affects on variables

- Safety features
- Manufacturers' operating procedures
- Obtain training from a qualified school, facility, or instructor.

Equipment Inspections and Maintenance

Operators shall conduct equipment inspections according to requirements in [GN470097](#), *Operating Light and Heavy Earth Moving Equipment*.

Operators shall refer equipment malfunctions to the appropriate organization for repair.

Managers shall ensure all equipment is scheduled for preventive maintenance with the Fleet Services Department (7849) for SNL/NM and TTR. At SNL/CA, contact the Maintenance Engineering Department (8513).

Records

The Fleet Services Department (7849) or the Maintenance Engineering Department (8513) shall retain equipment repair records for equipment. All ES&H training records shall be kept and maintained in the corporate training database.

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Excavating and trenching	Section 4H , "Excavations, Trenches, and Floor or Wall Penetrations"
Fuel and oil spills	Section 10F , "Oils, Greases, and Fuels"

REFERENCES

Requirements Source Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

[29 CFR 1926.20](#), *Safety and Health Regulations for Construction*.

Implementing Documents

SNL, [GN470097](#), *Operating Light and Heavy Earth Moving Equipment*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

Related Documents

See [GN470097](#), *Operating Light and Heavy Earth Moving Equipment*, for specific citations.



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ES&H Manual

Attachment 5-1 – SNL/NM Barbecue Grill Authorization Checklist

Subject Matter Expert: [Laura Draelos](#); CA Counterpart: [Marty Gresho](#)

MN471001, Issue L

Revision Date: [February 7, 2007](#); Replaces Document Dated: September 22, 2006

Review Date: March 21, 2006

Administrative Change: [May 8, 2007](#)

Use the following checklist to evaluate:

- Suitability of location.
- Exposure to surrounding facilities.
- Proximity of nearby hazards.

The following applies to all grills and individuals who use grills at SNL/NM:

Individuals involved in grilling operations shall be trained annually in the use of fire extinguishers ([FRP106](#) or equivalent).

A multi-purpose, dry-chemical fire extinguisher shall be readily available when operating grills.

Individuals involved in grilling are responsible for extinguishing any small fires and immediately communicating an alarm (i.e., activating the fire alarm and calling the fire department, 911, or 844-0911). Report all fires, even if extinguished.

Never store or use grills indoors.

Ensure grills are in good working condition.

Never use or store propane cylinders for grills indoors.

Propane cylinders are properly transported in accordance with DOT regulations.

 The maximum size of propane cylinders is 20 pounds and the cylinders must be within their hydrostatic test certification.


Use the grill at least 10 feet away from any buildings or structures.

Do **not** use grills within 50 feet of flammable or combustible material storage areas.

Do **not** use grills in a garage, breezeway, porch, or deck.

If using grills in remote areas, maintain a minimum distance of 35 feet from dry vegetation.

Follow manufacturer's instructions for starting grill.

 When finished grilling, shut off the propane fuel at the cylinder, or extinguish and cool charcoal coals prior to disposal.

Never use or store a grill in areas that are used as emergency escape routes (e.g., exit ways, exit doors, exit stairs).

Use and store grills on large flat surfaces that cannot burn (e.g., concrete or asphalt).

Contact the Incident Commander/Emergency Operations Center (IC/EOC), 844-4189, prior to and at completion of grilling operations (because of the smoke generated). Inform the dispatchers of the following:

- Tech area.
- Building number.





- Outside building location (north, south, east, west).
- Grilling time.

Keep this check list at the grill site with the following responsible party/grill owner's information:

Name: _____ Organization: _____ Phone: _____



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Attachment 5-2 – Use of Portable Space Heaters (PSHs)

Subject Matter Expert: [Laura Draelos](#); CA Counterpart: [Marty Gresho](#)

MN471001, Issue L

Revision Date: [February 7, 2007](#); Replaces Document Dated: September 22, 2006

Review Date: March 21, 2006

Administrative Change: [May 8, 2007](#)




Requirements

Members of the Workforce shall ensure that:

- Clearance between a PSH and any combustible surface is:
 - In accordance with manufacturer's recommendations (see name plate data).
 - At least 36 inches when the manufacturer's recommendations are **not** available.
- Flexible cords do **not** have worn, frayed, or damaged areas that present an electrical hazard (see [Section 4B](#) “Electrical Safety Practices,” for additional information).
- PSHs are not used in areas where hot objects or open flames aren't permitted due to the operations being conducted (e.g., around flammable solvents or explosives) unless they are listed for that use.
- PSHs are not used in computer rooms and record storage areas.
- PSHs are located in the open where combustible materials cannot fall on top of

them.

- PSHs are turned off if left unattended for more than 30 minutes.
- PSHs are only plugged into an occupancy-controlled power strip (i.e., no extension cords are used).

 **Note:** Occupancy-controlled power strips can be obtained through JIT (BSN IDP-3050, eight-outlet power strip with Auto-ON personal sensor, 8-ft. cord).

- Qualified electricians perform all repair and maintenance on PSHs.

Note: Members of the Workforce, for additional information, see the main chapter under the topic, "Operation of Heat Producing Appliances."



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ES&H Manual

ATTACHMENT 15-3 – SNL/NM BUILDING EVACUATION TEAM RESPONSIBILITIES

Subject Matter Expert: [Carol V. Bonney](#); CA Counterpart: [Judy Acosta](#)

MN471001, Issue H

Revision Date: [August 20, 2004](#), Replaces Document Dated: June 26, 2001

Review Date: June 18, 2006

Administrative Changes: June 29, 2005, July 5, 2006, and [November 6, 2006](#)



TRAINING

Requirements

Work Activity or Role	Required
Evacuation Team Captain and Building Evacuation Team	<p>EVAC101 (SNL/NM) – For on-site evacuation teams within Kirtland Air Force Base (KAFB) boundaries.</p> <p>EVAC102 (SNL/NM) – For off-site evacuation teams and on-site evacuation teams outside of KAFB boundaries.</p> <p>EVAC103 (Refresher training to be taken every three years or as recommended by evacuation team captain)</p>



Team Responsibilities

General team responsibilities for evacuation personnel are listed in the following table citations:

- [Incident Commander Point of Contact or the Fire Protection Contact](#)
- [Evacuation Team Captain](#)
- [Building Evacuation Team](#)

Specific team responsibilities for evacuation events are listed in the following table citations:

- [Fire](#)
- [Directed Evacuation](#)
- [Quiet Evacuation](#)
- [Shelter-In-Place](#)
- [Non-Traditional Events](#)

Note: Evacuation team members may receive emergency announcements for events other than fire by pager, e-mail, or other means of communication from emergency management personnel.

General Evacuation Team Responsibilities

Evacuation Personnel	Responsibilities

Incident Commander
Point of Contact or the
Fire Protection Contact

- Assist building evacuation teams with development of building-specific evacuation procedures.
- Assist the evacuation team captain in "right-sizing" the building evacuation team.
- Determine assembly areas, if requested.
- Conduct validation drills.
- Provide "train-the-trainer" classes.
- Provide identifier badges.
- Review and approve building-specific evacuation team procedures, if requested.

Evacuation Team
Captain

- Ensure building-specific evacuation plans are developed and communicated to the evacuation team for implementation and to the building residents for proper response.
- Ensure evacuation plans are implemented if an evacuation team member is not available. **This includes ensuring an appropriate number of alternates are designated during planned absences.**
- Notify the incident commander contact when an evacuation team member leaves his or her position **or when there is a change in the Building Evacuation Alphanumeric Pager List**
- Ensure the evacuation team is easily identified.
- **Ensure the Evacuation Team possesses**

adequate number of alphanumeric pagers.

Building Evacuation Team

- Attend Sandia Protective Action Notification (SPAN) training (see "[Training](#)").

Note: For additional information, see the Emergency Management SPAN training [web page](#).

- Understand and implement evacuation team procedures.
- Assist special needs personnel.
- Notify building occupants and personnel within close proximity of protective actions (e.g., evacuate, shelter in place).
- Notify the evacuation team captain when unable to perform team duties (e.g., transferred).
- Ensure easy identification as an evacuation team member during an incident (e.g., cap, ID badge).
- Perform only functions for which qualified and when it is safe to do so.

Specific Evacuation Team Responsibilities

Evacuation Event	Evacuation Personnel	Responsibilities
------------------	----------------------	------------------

Evacuation Event

Evacuation Personnel

Responsibilities

Fire

Note: Evacuation may be announced by fire alarm activation or by other indications of fire.



Evacuation Team Captain

- Ensure the incident has been reported from a safe location by dialing 911 (844-0911 by cellular phone).
- Coordinate the building evacuation.
- Collect information from evacuation team members or building personnel.
- Exit the building and report to the IC or other emergency response personnel.
- Brief the IC and emergency response personnel on the building hazards, specific information regarding personnel who require evacuation assistance, and related problems.

Building Evacuation Team

- Announce the fire alarm in restrooms and other areas where the alarm may not be heard.
- Check the sprinkler control valve and report the status (open or closed and accessibility) to the evacuation team captain when it is safe to do so.
- Direct occupants to refrain from using elevators.



- Direct occupants to follow normal or alternate exit routes to assembly areas in an orderly manner.
- Help occupants who need assistance.
- Direct persons who are unable to use stairs to an enclosed stairway or designated **area of rescue assistance** away from the danger area.
- Check enclosed stairways or designated places of refuge for persons who need assistance.
- Inform the Evacuation Team Captain and IC if assistance is needed to evacuate special needs personnel.
- Sweep the building and report results to the evacuation team captain **or zone/floor lieutenant**.

Directed Evacuation

Note: Directed evacuations are commonly due to a nearby building having a potential hazardous material release or other problem (e.g., floods,

Evacuation Team Captain

- Ensure deployment of the building evacuation team throughout occupied areas of the building.
- Pull the fire alarm or initiate building specific emergency procedures **as directed by the [Emergency Operations Center](#)**.
- Dial 844-6515 or 311 to confirm

weather, threat, suspicious package).



protective action notification, actions taken, actions planned, and related problems.

- Coordinate building evacuation in the specified direction.
- Exit the building and brief the IC or other emergency response personnel on protective actions taken, specific information regarding personnel who require evacuation assistance, and related problems.
- Coordinate further movement of personnel as necessary.

Building Evacuation Team



- Direct occupants to follow safe exit routes to assembly areas in an orderly manner.
- Help occupants who need assistance.
- Direct persons who are unable to use stairs to an enclosed stairway or designated area of rescue assistance away from the danger area.
- Check enclosed stairways or designated areas of rescue assistance for persons who need evacuation assistance.
- Inform the Evacuation Team Captain and IC or other





emergency response personnel if assistance is needed to evacuate special-needs personnel.

- Sweep the building and report results to the evacuation team captain.
- Notify personnel seen outside, close to the building, to proceed to the assembly area.
- Direct occupants to a new assembly area if required, as notified by the evacuation team captain or IC.

Quiet Evacuation

Note: Quiet evacuations are commonly due to a bomb threat or suspicious package.



Evacuation Team Captain

- Direct evacuation team **not** to activate alarms.
- Ensure deployment of the building evacuation team throughout occupied areas of the building.
- Coordinate the building evacuation.
- Minimize use of cellular phones and radios.
- Exit the building and report to the IC or other emergency response personnel.
- Brief the IC on protective actions taken, hazards located within the building, specific information



regarding personnel who require evacuation assistance, and related problems.

Building Evacuation Team

- Ensure all personnel are notified of the need to evacuate without alarms and to minimize the use of cellular phones and radios.
- Direct occupants to follow normal exit routes or designated routes to assembly areas in an orderly manner.
- Help occupants who need assistance.
- Direct persons who are unable to use stairs to **use elevators**. **If this is not possible, direct persons to an enclosed stairway or designated area of rescue assistance** away from the danger area.
- Check enclosed stairways or designated places of refuge for persons who need evacuation assistance.
- Inform the evacuation team captain and IC if assistance is needed to evacuate special-needs personnel.
- Sweep the building and report results to the evacuation team captain.

Shelter-In-Place

Note: Shelter-in-place refers to an event that requires individuals to remain in the building, taking shelter in specified areas.

Evacuation Team Captain

- Ensure deployment of the building evacuation team to all exits.
- Contact the Emergency Operations Center at 844-6515 or 311, and provide a briefing on protective actions taken and related problems.

Building Evacuation Team

- Ensure **Members of the Workforce** are told **not** to exit the building.
- Notify **Members of the Workforce** seen outside, close to the building, to come into the building to a designated shelter area.
- **Initially isolate persons brought into the building.**

Non-Traditional Events

Note: Non-traditional events refer to the need to disseminate important information to personnel in specific and affected buildings throughout SNL (e.

Evacuation Team Captain

- Follow specific instructions from Emergency Management personnel.
- Ensure deployment and coordination of the building evacuation team throughout occupied areas of the building to implement required actions.
- Contact the Emergency Operations Center at 844-6515

g., tornado warning or security alert).

or 311, to confirm notification, actions taken, actions planned, and related problems.

Building Evacuation Team

- Follow the specific instructions of the evacuation team captain or the IC.
- Notify personnel seen outside, close to the building, of actions taken.



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ES&H Manual

SECTION 10E – CHEMICAL SPILLS

Subject Matter Expert: [Nicholas A. Durand](#); CA Counterpart: [Janet Harris](#)

MN471001, Issue F, [June 10, 1997](#)

Requirements verified as current: October 8, 2001

Administrative Change: October 25, 2001

- [*Applicability](#)
- [*Training](#)
- [Cleanup Equipment](#)
- [*Control](#)
- [*Reporting](#)
- [**Cleanup](#)
- [Related Hazards and Activities](#)
- [*References](#)

* Indicates a substantive change

** Indicates a substantive addition

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce (employees and onsite contractors) who use, handle, transport, or store chemicals.

For cleaning up [spills](#) of oils, greases, or fuels at:

- SNL/NM and TTR, see [Chapter 10, Section F](#), "Oils, Greases, and Fuels."
- SNL/CA, contact the [waste pickup](#) contact.
- KTF, contact the site ES&H coordinator.

*TRAINING

Requirements

Work Activity	SNL/NM, TTR, KTF		SNL/CA	
	Required	Recommended	Required	Recommended
Personnel who routinely handle chemicals in their work	N/A	HAZ127	N/A	N/A

Personnel who routinely handle chemicals in their work activities and, therefore, may clean up a [spill](#), shall also be knowledgeable about the properties of the spilled material (training in [HAZ1011](#) and [HAZ103](#) as applicable).

If a site specific emergency response team has been established at SNL/NM, members shall be trained and approved by the emergency response training system in conjunction with the SNL Emergency Response Team.

Guidance

Contact your [Division ES&H Team](#) to determine if a site specific emergency response team should be established.

CLEANUP EQUIPMENT

Requirements

All organizations with a potential for [spills](#) shall have the following appropriate equipment available:

- Personal protective equipment
- Spill response equipment. (Spill equipment may include absorbents, neutralizers, plastic buckets with lids, 6 mil plastic bags, trays or shovels, and brooms.)

Spill equipment shall be of a quantity to control the amount of chemicals handled daily.

*CONTROL

Requirements

Control and cleanup responsibilities for a [spill](#) depend on the quantity and associated hazards. The usual steps that personnel shall use for controlling a spill are as follows:

Step	Action
1	Evacuate untrained personnel from the spill site for safety.
2	Keep untrained personnel from walking or driving through the spill. It may be necessary to isolate the area of the spill.
3	Determine the chemical and quantity spilled if it is possible to do so safely.
4	Consult the material safety data sheets (MSDSs) and area ES&H SOPs for information about the spilled chemical.
5	Clean up the spill or call for help.

*REPORTING

Requirements

Personnel shall report **small spills** of hazardous materials as follows:

Reporting Small <u>Spills</u>		
Site	Spill Quantity	Report To
SNL/NM, TTR, KTF, SNL/CA	Less than one pound solid or one pint liquid	Manager

Personnel shall report **large spills** of hazardous materials as follows:

Reporting Large Spills		
Site	Spill Quantity	Report To
SNL/NM	Greater than or equal to one pound solid or one pint liquid. Any gas leak.	Emergency^a : 911 (844-0911 for cellular phones) Non-Emergency : Non-Emergency Hotline (844-6515)
TTR	Greater than or equal to one pound solid or one pint liquid. Any gas leak.	Emergency^a : 911 Non-Emergency : 295-8285
KTF	Greater than or equal to one pound solid or one pint liquid. Any gas leak.	Emergency^a : 335-4333 Non-Emergency : 335-4333
SNL/CA	Greater than or equal to one pound solid or one pint liquid. Any gas leak.	Emergency^b : 911 (294-2222 for cellular phones) Non-Emergency : ES&H Hotline (294-3724)

^a If human life or the environment is threatened

^b If health, safety, or the environment is threatened or if more than five gallons of flammable liquid are spilled

Personnel shall report **radioactive material releases** of any quantity as follows:

Reporting Radioactive Material Releases		
Site	Type of Release	Report To
SNL/NM	Any release of regulated radioactive material to the environment or an uncontrolled area.	Emergency^a : 911 (844-0911 for cellular phones) Non-Emergency : Non-Emergency Hotline (844-6515)
TTR	Any release of regulated radioactive material to the environment or an uncontrolled area.	Emergency^a : 911 Non-Emergency : 295-8285
KTF	Any release of regulated radioactive material to the environment or an uncontrolled area.	Emergency^a : 335-4333 Non-Emergency : 335-4333
SNL/CA	Any unplanned or accidental release of radioactive material to the environment.	Business hours : ES&H Hotline (294-3724) Non-business hours : Central Alarm Station (294-2300)
^a If human life or the environment is threatened		

Guidance

SNL organizations having a spill should keep copies of any occurrence reports that are generated in department files.

*CLEANUP

Requirements

SNL/NM

Personnel generating a small [spill](#) are allowed to clean it up unless they lack training or equipment or they do not feel comfortable doing so. Personnel may request advice or assistance from the Non-Emergency Hotline (844-6515).

If there is a site specific emergency response team, members of the team shall clean up large spills. If no site specific emergency response team has been established, personnel shall call the Non-Emergency Hotline (844-6515) for spill response and cleanup. If human health or the environment is threatened, call 911 for emergency spill response and cleanup.

All spilled material, absorbents, neutralizers, and contaminated personal protective equipment shall be handled as chemical waste. Follow the requirements for containment, labeling, storage, and disposal request specified in [Chapter 19, Section A](#), "Chemical Waste Management."

SNL/CA

At SNL/CA, generators are allowed to clean up their own spills, if they feel comfortable doing so. Otherwise, generators shall consult the [waste pickup](#) contact for spill response and cleanup.

All spilled material, absorbents, neutralizers, and contaminated personal protective equipment shall be handled as hazardous waste. Follow the requirements for containment, labeling, storage, and disposal request specified in GN470075, *Guidelines for Hazardous Waste Generators at SNL/CA*.

TTR and KTF

Contact the site ES&H coordinator for spill cleanup.

RELATED HAZARDS AND ACTIVITIES

Hazard/Activity	Reference
Discharges to the sanitary sewer system	Section 10H , "Discharges to the Sanitary Sewer System"

Environmental release reporting	Section 18E , "Environmental Release Reporting"
Handling chemicals at SNL/CA	GN470094 , <i>Handling Chemicals at SNL/CA</i>
Polychlorinated biphenyl (PCB) management	Section 10D , "Polychlorinated Biphenyl (PCB) Management"

*REFERENCES

Requirements Source Documents

[29 CFR 1910.1200](#), *Hazard Communication*.

40 CFR 116, *Designation of Hazardous Substances*.

40 CFR 117, *Determination of Reportable Quantities for Hazardous Substances*.

40 CFR 261, *Identification and Listing of Hazardous Waste*.

40 CFR 262, *Standards Applicable to Generators of Hazardous Waste*.

40 CFR 265, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*.

40 CFR 300, *National Oil and Hazardous Substances Pollution Contingency Plan*.

40 CFR 302, *Designation, Reportable Quantities, and Notification*.

40 CFR 355, *Emergency Planning and Notification*.

40 CFR 370, *Hazardous Chemical Reporting: Community Right-To-Know*.

40 CFR 372, *Toxic Chemical Release Reporting: Community Right-To-Know*.

40 CFR 761, *Polychlorinated Biphenyl (PCB) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*.

[DOE 5400.1](#), *General Environmental Protection Program.*

[DOE 5400.5](#), *Radiation Protection of the Public and the Environment.*

[DOE 5484.1](#), *Environmental Protection, Safety, and Health Protection Information Reporting Requirements.*

[DOE 5500.1B](#), *Emergency Management System.*

[DOE 5500.2B](#), *Emergency Categories, Classes, and Notification and Reporting Requirements.*

[DOE 5500.3A](#), *Planning and Preparedness for Operational Emergencies.*

DOE 5500.10, *Emergency Readiness Assurance Program.*

[DOE O 151.1](#), *Comprehensive Emergency Management.*

[DOE O 232.1](#), *Occurrence Reporting.*

Implementing Documents

SNL, GN470075, *Guidelines for Hazardous Waste Generators at SNL/CA*, October 29, 1993.

SNL, MN471001, [Chapter 19, Section A](#), "Chemical Waste Management."



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ES&H Manual

SECTION 6A - INDUSTRIAL HYGIENE OVERVIEW

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Administrative Changes: April 18, 2001, April 2, 2004, October 11, 2005 and [November 16, 2005](#)



* Indicates a substantive change

- [Applicability](#)
 - [General Information](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all work performed at [Sandia-controlled premises](#).



GENERAL INFORMATION

Requirements

Managers shall provide Members of the Workforce with a healthful working environment, that is, adequate control of hazards and other stresses (e.g., [biological agents](#), [chemical substances](#), [musculoskeletal stressors](#)) in the workplace.

If Members of the Workforce suspect occupational health hazards are associated with laboratory operations, production, office, and other work, they shall contact their [Division ES&H Team](#) for assistance in evaluating, identifying, and controlling such hazards.

*Guidance

The following table summarizes potential hazards in the workplace and the applicable sections in this chapter that address those potential hazards:

Hazard Category	Applicable Section
Biological agents	Section 6N , "Biological Agents"
Physical agents	Section 6F , "Commercial Underwater Diving"
	Section 6G , "Lasers and intense Light"
	Section 6H , "Noise exposure and Hearing Conservation"
	Section 6J , "Nonionizing Radiation"
Chemical hazards	Section 6B , "Asbestos"
	Section 6D , "Hazard Communication Standard"
	Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
	Section 6L , "Eating and Drinking"
	Section 6S , "Toxic Substances Control Act (TSCA)"
Musculoskeletal hazards	Section 6V , "Ergonomics"
Other hazards	Section 6C , "Respiratory Protection"
	Section 6I , "Confined Space Entry at SNL/NM"

[Section 6K](#), "Hazardous Waste Operations and Emergency Response (HAZWOPER)"

[Section 6M](#), "Safety Showers and Eyewashes"

[Section 6P](#), "Local Exhaust Ventilation (LEV)"

[Section 6R](#), "Indoor Air Quality"

REFERENCES

*Requirements Source Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards*.

American Conference of Governmental Industrial Hygienists (ACGIH), 1996 TLVs[®] and BEIs[®]: *Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices*, Cincinnati, OH, 1996 or latest edition.

[DOE 0 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

SNL, [PG470218](#), *Worker Protection Program (WPP)*.

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SECTION 6T - ASPHYXIATING ENVIRONMENTS

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MN471001, Issue A

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Administrative Changes: [November 6, 2006](#)

* Indicates a substantive change



- [Applicability](#)
- [Training](#)
- [Asphyxiating Environments](#)
- [Asphyxiant Hazard Evaluation](#)
- [Ventilation Systems](#)
- [Oxygen Monitoring Systems](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - [6T-1](#) – Sample Asphyxiation Hazard Warning Sign
 - 6T-2 – Sample Standard Operating Procedure for Oxygen Deficiency Hazard Alarm Response ([Word file](#)/[Acrobat file](#))



APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities on [Sandia-controlled premises](#) involving the use or storage of [cryogenics](#), compressed gases, or other materials that may contribute to a potentially [asphyxiating environment](#) unless exempted. Additional requirements for [confined space](#) hazards are contained in [Section 6I](#), "Confined Space Entry."

Exemptions

Specific activities that are exempted include:

- Compressed gas cylinders or manifolded gas cylinder distribution systems that contain 500 cubic feet or less of asphyxiant and are not located in an unventilated or confined space.
- Stand-alone, cryogenic liquid Dewars with a capacity no greater than 180 liters, which are only used to refill smaller Dewars while under constant visual observation by the operator, and are not located in an unventilated or confined space.
- Rooms or areas where the volume of the enclosed area is greater than 15 times the gas volume of the largest potential cryogenic liquid spill or gas release.

TRAINING

There are no specific corporate training courses for asphyxiants. However, Members of the Workforce whose activities involve the use of asphyxiants shall complete either Lab Standard or HAZCOM training and any other training required for the hazards related to their specific activities. Appropriate training requirements can be determined by consulting the references provided in [Related Hazards and Activities](#) for asphyxiants.



ASPHYXIATING ENVIRONMENTS

Requirements

Managers responsible for areas or activities that have the potential for an [oxygen-deficient atmosphere](#) or [asphyxiating environment](#) shall be responsible for ensuring that:

- Hazards associated with the use of asphyxiant materials are identified, evaluated and controlled.
- Members of the Workforce are informed of the hazards associated with the asphyxiant materials present in the work area.
- Work areas that contain less than 19.5% oxygen are not occupied unless supplied air respiratory protection is provided.
- Required [engineering controls](#) such as local exhaust ventilation systems and flow restriction devices are installed and maintained.
- Required oxygen level alarm systems are installed and maintained.
- Site-specific oxygen alarm response procedures and training are developed for Members of the Workforce in areas where fixed, continuous oxygen alarm systems are installed.

Members of the Workforce shall:

- Be aware of the hazards associated with the asphyxiant materials present in their workplace.
- Follow applicable procedures when working with compressed gases or cryogenic liquids, including the use of required [personal protective equipment](#).
- Ensure that required engineering controls such as local exhaust ventilation

systems and flow restriction devices are utilized.

- Consult the [facilities support](#) contact for assistance with adjustments, maintenance, and repair of building related equipment, including ventilation systems and building gas/cryogenic liquid distribution systems.
- Be aware of and follow site-specific procedures in the event of an oxygen alarm activation.

Guidance

Atmospheric air normally contains 20.9% oxygen by volume with nitrogen being the primary constituent of the remainder. The release of an asphyxiant into a workspace can displace enough oxygen to significantly decrease the oxygen concentration to the point where an IDLH (Immediately Dangerous to Life or Health) atmosphere exists.

The Occupational Safety and Health Administration (OSHA) defines an atmospheric oxygen concentration less than 19.5% by volume as an oxygen deficient atmosphere (29CFR1910.134) that requires the use of atmosphere-supplying respirators.

Note: Work areas containing less than 19.5% oxygen shall not be occupied unless supplied air respiratory protection is provided.

Due to their large liquid-to-gas expansion ratios, even small amounts of cryogenic liquids have the potential to create an oxygen deficient atmosphere when vaporized at room temperature. At sea level and 70 °F, cryogenic liquids expand by a factor of about 700 – 1000 with the expansion volume increasing with altitude. Liquid-to-gas expansion ratios for some cryogenes used at SNL are given in Table 1. Final gas volumes for a one liter liquid release are shown for both SNL/CA and SNL/NM locations.

Table 1. Liquid-to-Gas Expansion Ratios for Selected Cryogenes

Property	Cryogen			
	Nitrogen	Argon	Helium	Hydrogen
Liquid density (g/L)	808	1395	125	71
Liquid-to-gas expansion ratio SNL/CA (70 °F, 760 mm)	697	841	754	850
Cu-ft gas produced / liter of liquid SNL/CA (70 °F, 760 mm)	24.6	29.7	26.6	30.0
Liquid-to-gas expansion ratio SNL/NM (70 °F, 630 mm)	840	1015	910	1025
Cu-ft gas produced / liter of liquid SNL/NM (70 °F, 630 mm)	29.7	35.8	32.1	36.2

Factors that determine the rate and ultimate level of oxygen depletion include:

- Total volume of asphyxiant released.
- Physical state of the released asphyxiant (cryogenic liquid or gas.)
- Asphyxiant release rate.
- Volume of the affected space.
- Ventilation provided by local exhaust systems or the general building ventilation.

Conditions to consider that lead to an increased chance of an oxygen deficient atmosphere include:

- Large quantities of gaseous or liquid asphyxiants present.
- Small spaces.



- Enclosed spaces with poor ventilation such as stairwells, storage closets, and equipment chases.
- Poor building ventilation (less than six air changes per hour).
- Inappropriate or failure-prone valves, transfer lines or other hardware,
- Lack of flow limiting devices.
- Unattended operations, including unattended filling of portable cryogenic liquid Dewars from larger supplies. Many large volume accidental releases that have occurred at SNL were the result of automated valve failures or manual valves inadvertently left open (e.g. forgotten) by the system operator.
- Lack of operator training and awareness.



ASPHYXIANT HAZARD EVALUATION

Requirements

All applications using asphyxiating cryogenic liquids or gases shall be evaluated by the appropriate [Division ES&H Team](#) industrial hygiene or safety engineering representative unless specifically exempted below:

- **Building distribution systems:** All applications involving “house” supplied asphyxiant gases or liquids shall be evaluated to determine the need for engineering and administrative controls.
- **Liquid Dewar supplies:** All applications involving liquid Dewar supplies shall be evaluated to determine the need for engineering and administrative controls, particularly oxygen monitoring.



Note: Stand-alone Dewars, with a capacity no greater than 180 liters that are not connected to any equipment and are only used to refill smaller Dewars while under constant visual observation by the operator

may be exempted from monitoring. After use, the operator shall ensure that the shut off valve is fully closed and that there is no leakage.

- **Gas supply systems containing greater than 500 cubic feet of asphyxiant:** All applications involving gas supplies with the potential to release more than 500 cubic feet of asphyxiant shall be evaluated to determine the need for engineering and administrative controls.
- **Compressed gas cylinders or manifolded gas cylinder distribution systems containing 500 cubic feet or less of asphyxiant:** Unless used in a poorly ventilated or confined space, no evaluation is required.

VENTILATION SYSTEMS

Requirements

If [local exhaust ventilation \(LEV\)](#) or general dilution ventilation provided by building HVAC (Heating, Ventilation and Cooling) systems is used as a primary hazard control measure, the ventilation system shall be monitored for proper operation during operations.

All LEV systems shall be constructed, installed, and maintained in accordance with industry standards.

For attended operations during normal hours visual observation may suffice. However, for unattended operations or operations conducted outside of normal hours the ventilation system shall be monitored or a fixed oxygen monitoring system shall be installed within the potentially affected area.

All LEV systems shall be installed and maintained in accordance with the requirements and guidance contained in [Section 6P](#), "Local Exhaust Ventilation (LEV)."

OXYGEN MONITORING SYSTEMS

Requirements

Due to the large storage capacities of building distribution systems, fixed continuous oxygen monitors and alarms are required in all areas using cryogenic liquids supplied by means of a building distribution system. The most commonly encountered systems at SNL are liquid nitrogen and liquid argon systems. In addition, all other uses of gaseous and cryogenic asphyxiants that are not specifically [exempted](#) shall be evaluated by the appropriate [Division ES&H Team](#) industrial hygiene or safety engineering representative to determine the need for oxygen monitoring and alarms.

In areas where continuous oxygen monitoring is required only fixed oxygen monitors and alarms are allowed. Portable oxygen monitors are only allowed when the need is immediate, intermittent, or the space does not warrant the cost of installing a fixed monitor.

The use of a portable oxygen monitor in lieu of a fixed monitor shall be approved and documented by the appropriate [Division ES&H Team](#) industrial hygiene or safety engineering representative.

Oxygen monitors and alarms shall be procured, installed, and maintained in accordance with guidance from the [Safety & Health Instrumentation & Standards](#) group.

Audible alarms shall be loud enough to alert all potentially affected persons in the area and visual alarms shall be seen from room or area access points. If visual alarms cannot be seen from access points, remote readouts shall be installed at access points.

Warning signs shall be posted at access points to alert personnel that an oxygen deficient atmosphere exists when the alarm is activated. Signs must indicate the nature of the hazard, actions to be taken, and emergency telephone numbers. [Attachment 6T-1](#) is an editable template in the required sign format.

In areas where oxygen deficiency alarms are installed, personnel training and

written alarm response procedures are required. All personnel assigned to the immediate area and any adjacent areas that could be affected in the event of an asphyxiant release under normal work conditions or a [foreseeable emergency](#) shall complete alarm response training. This training shall be integrated into HAZ103 or LAB103 site-specific training and include:

- Identification of asphyxiant sources
- Location and operation of control and shut off valves
- Location and content of warning signs
- Exit locations and safe evacuation routes
- Alarm recognition training by means of an actual alarm activation
- Alarm response/evacuation procedures

[Attachment 6T-2](#) contains an example Standard Operating Procedure (SOP) regarding oxygen deficiency alarm response that can be modified and used. However, if desired, written alarm response procedures may be included in another operational procedure in lieu of maintaining a stand-alone alarm response SOP.

Guidance

- For fixed installations where power failure is a concern, the alarm system should be connected to an emergency power supply system or an uninterruptible power supply (UPS) should be used.
- The appropriate [Division ES&H Team](#) industrial hygiene or safety engineering representative should be consulted to determine signage and alarm response training requirements.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [asphyxiants](#) include:

Hazard/Activity	Reference
Design, installation, and use of pressure systems	Section 4D , "Pressure Safety Operations" CPR400.1.1.27/ MN471000 , "Pressure Safety Manual"
Workplace exposure to chemicals during chemical-related work	Section 6D , "Hazard Communication Standard" Section 6E , "Laboratory Standard - Chemical Hygiene Plan"
Asphyxiant hazards in confined spaces	Section 6I , "Confined Space Entry"
Design, installation and use of local exhaust ventilation (LEV) equipment to control asphyxiant hazards	Section 6P , "Local Exhaust Ventilation (LEV)"
Cryogenic fluid hazards	CPR400.1.1.36/GN470100 , "Safe Handling of Cryogenic Fluids"

REFERENCES

Requirements Source Documents

[29 CFR 1910](#), *Occupational Safety and Health Standards* .

American Conference of Governmental Industrial Hygienists (ACGIH), 2006 *TLVs[®] and BEIs[®]: Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices*, Cincinnati, OH, 2006 or latest edition.

[DOE 0 440.1A](#), *Worker Protection Management for DOE Federal and Contractor*


Employees.

Implementing Documents

SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program.*

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program.*

SNL, [PG470218](#), *Worker Protection Program (WPP).*

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ES&H Manual

*SECTION 6Y – THERMAL STRESS

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MN471001, Issue B

Revision Date: [June 21, 2006](#), Replaces Document Dated December 7, 2005

* Indicates a substantive change



- [Applicability](#)
- [*Control of Heat Stress](#)
- [*Control of Cold Stress and Cold Injury](#)
- [Related Hazards and Activities](#)
- [References](#)
- Attachments
 - [6Y-1](#) – Heat Stress Screening Criteria

APPLICABILITY

For purposes of this document, Members of the Workforce are:



- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose work activities may include exposure to [thermal stressors](#) that can lead to adverse health effects. This includes work activities that involve both natural temperature extremes (i.e., hot and cold) and man-

made sources of [thermal hazards](#), such as being exposed to cryogenics, or working next to boilers or in facilities where temperature and humidity can be controlled (e.g., walk-in environmentally controlled rooms such as walk-in freezers, environmental test chambers, or foundries).

*CONTROL OF HEAT STRESS

Requirements

Managers shall be responsible for ensuring that:

- The exposure of Members of the Workforce to [heat stressors](#) is controlled such that they do not exceed [Threshold Limit Values \(TLVs\)](#), as found in the current American Conference of Governmental Industrial Hygienists (ACGIH) TLVs ® and BEIs ®: *Threshold Limit Values for Chemical Substances and Physical Agents*, for [heat stress](#). These controls include, but are not limited to, ensuring that:
 - Members of the Workforce are not routinely exposed to temperatures that can raise the [core body temperature](#) above 38 ° C (100.4 ° F).
 - If clothing does not allow air and water vapor movement, or if the criteria found in Attachment 6Y-1, "[Heat Stress Screening Criteria](#)," are exceeded, contact the [IH on their Division ES&H Team](#) so that [heat-strain](#) monitoring can be performed.
 - Job-specific controls are implemented to ensure compliance with the ACGIH) TLVs.

Managers shall contact the [IH on their Division ES&H Team](#) for assistance with the following:

- Determining exposures to [heat stressors](#) and the applicability of ACGIH [TLVs](#).
- Determining appropriate control measures to reduce exposure of Members of the Workforce to heat stressors.

- Determining a work/rest regimen as an administrative control.
- Identifying, evaluating, and controlling [thermal hazards](#) associated with [heat stress](#).
- Training Members of the Workforce to recognize signs and symptoms of heat-related illnesses.
- Ensuring that Members of the Workforce have access to water prior to and during tasks that require exposure to both hot and cold environments.

Note: The reduction of dehydration has been found to be instrumental in protecting individuals from illness and injury related to heat stress and [cold stress](#).



Guidance:

Members of the Workforce should:

- Be aware of temperature changes within their assigned work areas and dress appropriately.
- Notify their managers when significant changes in heat stressors occur for a given task.

*CONTROL OF COLD STRESS AND COLD INJURY




Requirements


Managers shall be responsible for ensuring that:

- The exposure of Members of the Workforce to [cold stressors](#) is controlled such that they do not exceed American Conference of Governmental Industrial Hygienists (ACGIH) [Threshold Limit Values \(TLVs\)](#) for cold stress or [cold injury](#) as

follows:

- 
- If continuous work is performed repeatedly for 8 hours a day, 40 hours a week, for extended periods of time in [air temperatures](#) below 4 ° C (40 ° F), to include wind chill equivalent temperature, one of the following is observed:
 - Adequate insulating dry clothing is provided to Members of the Workforce to maintain [core body temperature](#) above 36 ° C (96.8 ° F).
 - Administrative controls are in place to ensure that work-warming schedules reduce the duration of exposure to temperatures at less than 4 ° C (40 ° F) so that the core body temperature is maintained above 36 ° C (96.8 ° F).
 - Members of the Workforce are not routinely exposed to environments that result in lowering the core body temperature below 36 ° C (96.8 ° F), or that lower the core body temperature to 35 ° C (95 ° F) for a single, occasional exposure.
 - Special hand protection is used to maintain manual dexterity for the prevention of accidents when barehanded [fine work](#) is required for more than 10 to 20 minutes below 60.8 ° F.
 - Metal tools used at temperatures at or below 30.2 ° F should be insulated against contact cold injuries.

Managers shall contact the IH on their [Division ES&H Team](#) for assistance with the following:

- 
- Determining exposures to [cold stressors](#) and the applicability of ACGIH [TLVs](#).
 - Determining appropriate control measures to reduce exposure of Members of the Workforce to cold stressors that can result in [hypothermia](#), [frostbite](#), [trench foot](#), etc.
 - Determining a work/warming regimen as an administrative control.
 - Recognizing signs of hypothermia; e.g. shivering, dizziness, drowsiness, irritability,

and diminished levels of consciousness and dexterity.

- Identifying, evaluating, and controlling [thermal hazards](#) associated with [cold stress](#).
- Training Members of the Workforce to recognize signs and symptoms of cold-related injuries and illnesses.

Guidance

Members of the Workforce should:

- Be aware of temperature changes within their assigned work areas and dress appropriately.
- Notify their managers when changes in physical exertion and clothing requirements occur for a given task.
- Recognize that contributing factors to [cold injury](#) and illness can include drug use (both over-the-counter and prescription), alcohol use, smoking, caffeinated drinks, dehydration, age, previous cold injury, vibration (air hammer use), etc.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to [thermal stress](#) include:

Hazard/Activity	Reference
Personal protective equipment (PPE) and clothing	Section 4L , "Personal Protective Equipment (PPE)."
Additional criteria regarding PPE for cryogenics	MN471000, <i>Pressure Safety Manual</i> , Chapter 5 , "Selecting and Assembling Pressure Hardware."
Hazard communication	Section 6D , "Hazard Communication Standard."

Underwater Diving	Section 6F , "Commercial Underwater Diving."
Use of Sandia Workplace Hazards Awareness System (SWHAS) signs	Section 4M , "Signs (Including SWHAS) and Tags."
Hot work	Section 4E , "Hot Work Safety."
Working in High-Injury-Potential/Remote Operations	Section 4A , "Working in High-Injury-Potential/Remote Operations."
Construction and Construction-Like Activities	Section 4V , "ES&H for Contracted Construction and Construction-Like Activities."
Medical services	Chapter 16 , "Health, Benefits, and Employee Services"



REFERENCES

Requirements Source Documents

29 USC 654, *OSH Act of 1970*, [Section 5 - Duties](#).

ACGIH, *2003 TLVs ® and BEIs ®: Threshold Limit Values for Chemical Substances and Physical Agents*, "Biological Exposure Indices," Cincinnati, Ohio, 2003, or latest edition.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

Implementing Documents



SNL, [PG470019](#), *SNL/NM Industrial Hygiene Program*.

SNL, [PG470196](#), *SNL/CA Industrial Hygiene Program*.

Related Documents

[DOE-STD-5503-94](#), *EM Health and Safety Plan Guidelines*.

[DOD-TB MED 81](#), *Cold Weather Injury Prevention*.

[DOD-TN/02-2](#), *Sustaining Health and Performance in Cold Weather Operations*.

[DOD-NEHC-TM6290.91-2 Rev. B](#), *Industrial Hygiene Field Operations Manual*, Chapter 2, "Industrial Hygiene Surveys and Survey Reports."

[DoD, U.S. Navy Diving Manual](#), Sections 2.8 and 3.12.



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ES&H Manual

CHAPTER 7 – ACCOUNTABILITY AND OPERATIONAL MODES FOR FACILITIES

Subject Matter Expert: [Larry King](#); CA Counterpart: [Gary Shamber](#)
MN471001, Issue A
Revision Date: [July 15, 1998](#), Replaces Document Dated: N/A
Administrative Changes: [June 29, 2005](#)

*Indicates a substantive change

- [Applicability](#)
- [Campaign Mode for Facilities](#)
- [Standby Mode for Facilities](#)
- [Procedure for Transferring the Accountability of Facilities](#)
- [Inspection Requirements for Inactive Facilities](#)
- [Activation of Inactive Facilities](#)
- [Related Hazards and Activities](#)
- [References](#)
- Forms
 - SF 2001-FCL, Facility Checklist form ([Word file](#)/[Acrobat file](#))
 - SF 2001-SEC, Systems Evaluation Checklist form ([Word file](#)/[Acrobat file](#))

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to the transfer of occupancy and temporary and permanent shutdown of operations and processes within space and facilities at [Sandia-controlled premises](#). If an internal lease agreement (ILA) contains more specific information for a facility, the ILA overrides this section.


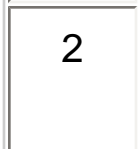
This section does **not** apply to the partial shutdown (temporary or permanent) of operations and processes. Members of the Workforce should contact their [building manager](#) at SNL/NM, the [facilities support](#) contact at SNL/CA, or the range manager at TTR for assistance and approval regarding partial shutdowns.

CAMPAIGN MODE FOR FACILITIES


Requirements

[Assigned tenants](#) at SNL/NM, TTR, and SNL/CA shall perform the following to place a facility in [campaign mode](#) for the first time:

Step	Action

 <p>1</p>	<p>Obtain approval by contacting one of the following:</p> <ul style="list-style-type: none"> • At SNL/NM, contact the building manager • At SNL/CA, contact the facilities support contact • At TTR, contact the range manager
 <p>2</p>	<p>Specify surveillance and preservation requirements and minimal utilities support by completing a Facility Checklist form (see SF 2001-FCL [Word file/Acrobat file] for an SNL/NM form) and a Systems Evaluation Checklist form (see SF 2001-SEC [Word file/Acrobat file] for an SNL/NM form) in conjunction with the building manager. To obtain SNL/CA forms, consult the facilities support contact.</p>

After receiving campaign mode approval, assigned tenants at SNL/NM, TTR, and SNL/CA shall perform the following steps each time the facility is placed in campaign mode (see "[INSPECTION REQUIREMENTS FOR INACTIVE FACILITIES](#)" for more information):

Step	Action
 <p>1</p>	<p>Contact the building manager (at SNL/NM), the facilities support contact (at SNL/CA), or the range manager (at TTR) to:</p> <ul style="list-style-type: none"> • Request a change in facility utilization. • Receive facilities-related information and guidelines for incurring costs.
<p>2</p>	<p>Notify the organizational ES&H coordinator of the expected campaign mode dates.</p>
<p>3</p>	<p>Arrange for owners of classified material to remove the material from the facility.</p>

4	Arrange for the removal of hazardous waste from waste containers by consulting the appropriate waste pickup contact.
5	Arrange for the preservation and/or protection (e.g., administrative lockout) of equipment and systems.
6	Continue operations required by environmental permits.
7	Ensure remaining hazards (e.g., confined spaces, fixed contamination) are identified and controlled.
8	At SNL/NM, inform the Facilities Business Office contact that the facility is going into campaign mode so that monthly space charges will be appropriately adjusted.

STANDBY MODE FOR FACILITIES

Requirements

[Assigned tenants](#) at SNL/NM, TTR, and SNL/CA shall perform the following tasks to place a facility in [standby mode](#) (see "[INSPECTION REQUIREMENTS FOR INACTIVE FACILITIES](#)" for more information):

Step	Action
1	<p>Contact the building manager (at SNL/NM), the facilities support contact (at SNL/CA), or the range manager (at TTR) to:</p> <ul style="list-style-type: none"> Request a change in facility utilization. Receive facilities-related information and guidelines for incurring costs.

2	Notify the organizational ES&H coordinator of the expected standby mode dates.
3	Arrange for owners of classified material to remove the material from the facility.
4	Arrange for the removal of hazardous waste and hazardous waste containers. Consult the appropriate waste pickup contact for waste pickup.
5	Arrange for the removal and storage of all hazardous material.
6	Arrange for the preservation and/or protection (e.g., administrative lockout) of remaining equipment and systems.
7	Specify surveillance and preservation requirements and minimal utilities support by completing a Facility Checklist form (see SF 2001-FCL [Word file/Acrobat file] for an SNL/NM form) and a Systems Evaluation Checklist form (see SF 2001-SEC [Word file/Acrobat file] for an SNL/NM form) in conjunction with the building manager. To obtain SNL/CA forms, consult the facilities support contact.
8	Consult the environmental permit contact to make any changes to existing permits.
9	Ensure remaining hazards (e.g., confined spaces, fixed contamination) are identified and controlled.
10	At SNL/NM, inform the Facilities Business Office contact that the facility is going into standby mode so that monthly space charges will be appropriately adjusted.

PROCEDURE FOR TRANSFERRING ACCOUNTABILITY OF FACILITIES



Requirements


[Assigned tenants](#) at SNL/NM and SNL/CA shall perform the following to transfer the accountability of a facility:

Step	Action
1	Contact the building manager (at SNL/NM), the facilities support contact (at SNL/CA), or the range manager (at TTR) to: <ul style="list-style-type: none"> ● Request a change in facility utilization. ● Receive facilities-related information and guidelines for incurring costs.
2	Complete SA 6610-FST, Facilities Space Transaction Form (Word file/ Acrobat file), to request the return of the space and adhere to SNL's space return policies.
3	Maintain all environmental permit requirements for the facility until the transfer is complete.
4	Arrange for the removal of all programmatic equipment and associated systems and material from the facility unless exempted by the building manager (at SNL/NM) or the facilities support contact (at SNL/CA).
5	Consult the environmental permit contact to make any changes to existing permits.
6	Ensure remaining hazards (e.g., confined spaces, fixed contamination) are identified and controlled.

INSPECTION REQUIREMENTS FOR INACTIVE FACILITIES


Requirements

[Assigned tenants](#) at SNL/NM, TTR, and SNL/CA shall follow these steps for inspecting inactive facilities that have been placed in [campaign mode](#):




Step	Action
1	If the facility has been in campaign mode for at least a month, conduct a monthly walkthrough and record the results in a log book.
2	Contact the appropriate Division ES&H Team for more information on specific inspection requirements.

Assigned tenants at SNL/NM, TTR, and SNL/CA shall follow these steps for inspecting inactive facilities that have been placed in [standby mode](#):



Step	Action
1	Consult the facilities support contact to arrange for monthly preventive maintenance inspections of inactive facilities.
2	Designate a representative to conduct a preventive maintenance inspection using a graded approach, in conjunction with a building manager, of systems and equipment of inactive facilities to determine: <ul style="list-style-type: none"> ● Facility, system, and component conditions. ● Operational and maintenance requirements for critical mechanical and electrical equipment (e.g., fire extinguishers, alarms). ● Possible contamination or hazardous, flammable, or radioactive material issues. ● Asset inventories for possible removal or reapplication. ● Future use capabilities and requirements of the facility.



3	Document any facility problems in a facility log book.
4	Consult the environmental permit contact to make any changes to existing permits.
5	Ensure remaining hazards (e.g., confined spaces, fixed contamination) are identified and controlled.



ACTIVATION OF INACTIVE FACILITIES

Requirements

[Assigned tenants](#) at SNL/NM, TTR, and SNL/CA shall perform the following to activate a facility that has been in [campaign mode](#):

Step	Action
1	Contact the building manager (at SNL/NM), the facilities support contact (at SNL/CA), or the range manager (at TTR) to: <ul style="list-style-type: none"> • Request a change in facility utilization. • Receive facilities-related information and guidelines for incurring costs.
2	Notify the organizational ES&H coordinator of the date that the facility will be reopened.
3	Inspect equipment and the facility for signs of deterioration (e.g., ceiling leaks, water leaks, oil leaks, warning indicators), and notify the appropriate organization to resolve any problems.

4	Inspect the facility for signs of rodents (e.g., droppings, nests). Consult the pest/rodent control contact for assistance with cleanup.
5	Note in a facility log book any signs of deterioration and associated corrective actions to be taken.
6	Continue any operations required by environmental permits.
7	Ensure remaining hazards (e.g., confined spaces, fixed contamination) are identified and controlled.
8	At SNL/NM, inform the Facilities Business Office contact that the facility is being activated.

Assigned tenants at SNL/NM, TTR, and SNL/CA shall perform the following to activate a facility that has been in [standby mode](#):

Step	Action
1	Contact the building manager (at SNL/NM) or the facilities support contact (at SNL/CA) to: <ul style="list-style-type: none"> ● Request a change in facility utilization. ● Receive facilities-related information and guidelines for incurring costs.
2	Notify the organizational ES&H coordinator of the date that the facility will be reopened.
3	Provide the building manager with a case number to use in restarting labor and material charges.
4	Inspect equipment and the facility for signs of deterioration (e.g., ceiling leaks, water leaks, oil leaks, warning indicators), and notify the appropriate organization to resolve any problems.

5	Inspect the facility for signs of rodents (e.g., droppings, nests). Consult the pest/rodent control contact for assistance with cleanup.
6	Note in a facility log book any signs of deterioration and associated corrective actions to be taken.
7	Approve a list of activities and expected costs necessary to place the facility back into an operational status before activation (1-month lead time is recommended).
8	Review repairs recommended by facilities representatives and provide a case number for repairs that are deemed necessary.
9	Consult the environmental permit contact to make any changes to existing permits.
10	Ensure remaining hazards (e.g., confined spaces, fixed contamination) are identified and controlled.
11	At SNL/NM, inform the Facilities Business Office contact that the facility is being activated.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to accountability and operational modes for facilities include:

Hazard/Activity	Reference
Rodent droppings and/or nesting material	Section 6K , "Miscellaneous Industrial Hygiene Topics"

Radioactive material management area (RMMA) issues

[Section 19D](#), "Radioactive Material Management Areas (RMMAs)"

[Chapter 8](#), "Occupational Radiation Protection"

Reapplication of excess property

CPR 500.2.3, Property/Assets User's Manual, ["Identifying and Removing Excess Property."](#)

REFERENCES



Requirements Source Documents

AL 5480.31, *Startup and Restart of AL Facilities.*

[DOE 4330.4B](#), *Maintenance Management Program.*

[DOE 5480.7A](#), *Fire Protection.*

Implementing Documents

SNL, [CPR400.4.2](#), *Space and Land Management Manual.*

SNL, [Decontamination, Decommissioning, Demolition, and Re-Use Program Management Plan.](#)

SNL, [Building Assessment and Decontamination Health and Safety Plan.](#)

SNL, [GN470034](#), *Performing and Documenting Management Surveillances.*

SNL, [GN470089](#), *Risk Management Requirements for Moderate- and High-Hazard Nonnuclear, Accelerator, and Nuclear Facilities.*

SNL, [PG470083](#), *Risk Management Program.*

Related Documents

AL 430.1, *Life-Cycle Asset Management*.

DOE G 430.1-2, *Surveillance & Maintenance During Facility Disposition*.

DOE G 430.1-3, *Deactivation Implementation Guide*.

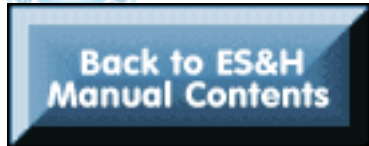
DOE G 430.1-4, *Decommissioning Implementation Guide*.

[DOE O 420.1](#), *Facility Safety*.

[DOE O 425.1](#), *Startup and Restart of Nuclear Facilities*.

[DOE O 430.1](#), *Life-Cycle Asset Management*.

[DOE-STD-3006-95](#), *Planning and Conduct of Operational Readiness Reviews*.



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ES&H Manual

CHAPTER 13 – HAZARDS IDENTIFICATION/ ANALYSIS AND RISK MANAGEMENT

MN471001, Issue U

Revision Date: [April 12, 2007](#), Replaces Document Dated: September 28, 2006

* Indicates a substantive change

- [*Section 13A](#) - Hazards Identification and Classification Process
 - [Section 13B](#) - Hazards Analysis Process
 - [Section 13C](#) - Authorization Basis Process
 - [Section 13D](#) - Readiness Review Process - Planning, Review, and Approval
 - [Section 13E](#) - Risk Criteria for Flight Vehicle Operations
-

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ES&H Manual

CHAPTER 17 – AIR EMISSIONS

MN471001, Issue H

Revision Date: [March 5, 2007](#); Replaces Document Dated: March 6, 2006

* Indicates a substantive change

- *[Section 17B](#) - Air Permits
 - [Section 17C](#) - Air Emissions Control Measures
 - [Section 17D](#) - Ozone Depleting Substances (ODSs)
 - [Section 17E](#) - Radionuclide National Emissions Standards for Hazardous Air Pollutants (NESHAP)
-

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2007

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ES&H Manual

CHAPTER 18 – REPORTING, INVESTIGATING, AND CORRECTING ES&H EVENTS

MN471001, Issue P (O not used)

Revision Date: [May 25, 2007](#), Replaces Document Dated: April 12, 2007

* Indicates a substantive change

- [*Section 18A](#) - Reporting ES&H Concerns and Suggestions for Improvement
- [Section 18B](#) - Safety Engineering Accident Investigation (AI) Process
- [Section 18C](#) - Occurrence Reporting
- [Section 18E](#) - Environmental Release Reporting
- [Section 18F](#) - Reporting Vehicle Accidents and Property Damage
- [Section 18G](#) - Identifying, Reporting, and Correcting Nuclear Safety Nonconformances



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ES&H Manual

*SECTION 10C – MIGRATORY BIRDS, PROTECTED SPECIES, AND OTHER BIOTA


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MN471001, Issue C

Revision Date: [March 16, 2006](#); Replaces Document Dated: November 10, 2003

Review Date: March 7, 2006


*Indicates a substantive change

- 
- [Applicability](#)
 - [*Work Activity Planning](#)
 - [*Pest Control and Feral Animals](#)
 - [Removal Requests](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."



This section applies to all Members of the Workforce who conduct activities on [Sandia-controlled premises](#) that have the potential to affect:

- [Protected species](#) (e.g., fish, plants, wildlife) or their habitats.

- [Migratory birds](#), their nests, eggs, or fledglings.
-

*WORK ACTIVITY PLANNING

Requirements

Managers shall be responsible for ensuring that:

- The [ecology contact](#) is consulted for work activities that have the potential for personnel to interact with [protected species](#), [migratory birds](#), nests, eggs, or their habitats.
- Ecology requirements (e.g., surveys) are integrated into project planning processes.

Members of the Workforce shall **not** take, possess, remove, kill, transport, or import migratory birds, their eggs, parts, and nests.

Note: A removal or disturbance of such without following the proper procedure may result in a reportable occurrence and penalties.

Members of the Workforce shall consult the [ecology contact](#) when a proposed work activity has the potential to affect protected species, migratory birds, nests, eggs, fledglings, or their habitats. Activities include but are not limited to the following:

- Pesticide/herbicide application in open fields, on shrubs, or on trees.
- Construction or maintenance activities that require mowing, grading, or excavation.

Note: For areas that are covered by existing mowing and grading plans, consult the [ecology contact](#) prior to nesting season to verify mowing or grading may occur.

- SNL/CA is subject to the no-till/no-grade policy issued by DOE on January 18, 2000. Exemptions from this policy require prior approval from DOE. Prior to

mowing in undeveloped grassland areas of the SNL/CA site, consult the [ecology contact](#) to identify specific areas of sensitivity.

- Activities that have the potential to affect areas inhabited by prairie dogs and other ground squirrels.

Note: Protected species may use burrows, including prairie dog burrows, for shelter, nesting, or other activities.

- Operation of off-road vehicles.
- Site preparation for new buildings or facilities.

- Activities that alter the ambient air, water quality, or soil quality in the habitat of protected species.

- Activities that affect the food supply, shelter, or other aspects related to protected species.
- Activities that produce noise and visual disturbances, such as outdoor tests of components or explosives.

Note: If the ecology contact determines adequate survey information exists for the area of the proposed action, that survey information is provided by the ecology contact to DOE when necessary. If adequate survey information does **not** exist for the area of the proposed action, the ecology contact coordinates surveys of the area by recognized experts (biologists or ecologists) to identify protected species and provides survey information to DOE. After DOE approval, the ecology contact notifies the customer and provides documentation regarding completion of the protected species compliance process.

Members of the Workforce shall: Initiate the migratory bird and protected species compliance process before or at the same time as the DOE and U.S. Air Force NEPA compliance processes (see CPR400.1.1/MN471001, *ES&H Manual*, [Section 10B](#), “National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties”). For NEPA compliance processes, consult the [NEPA specialist](#).

Guidance

Members of the Workforce should:

- Include protected species and migratory birds work activity planning in line operating procedures (OPs) when applicable.
- Be aware that a protected species removal/disturbance request may affect project schedules and cost.
- Be aware that a biological impact analysis, if required, may affect project schedules and costs; in such cases, consult the [ecology contact](#).
- Read the following documents:
 - U.S. Fish & Wildlife Service, "[Migratory Birds Are Protected By Federal Law](#)."
 - U.S. Fish & Wildlife Service, "[Endangered Species General Information](#)."

*PEST CONTROL AND FERAL ANIMALS

Requirements

Managers of personnel who engage in work that involves pest control and potential contact with feral animals shall be responsible for ensuring that:

- Pesticides classified by the EPA for restricted use are used only by or under direct supervision of certified applicators, or under regulatory restrictions required by [40 CFR 171](#), *Certification of Pesticide Applicators*.
- Applicable sections of [CPR400.1.1/MN471001](#), *ES&H Manual*, are followed when work involves the use of pesticides:
 - [Section 6E](#), "Laboratory Standard - Chemical Hygiene Plan"
 - [Section 6D](#), "Hazard Communication Standard"

- [Section 10B](#), “National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties”

Members of the Workforce shall take the following actions when interacting with wildlife:

- Avoid contact with potentially hazardous [biota](#) (e.g., snakes, rodents, coyotes, [feral](#) animals, poison ivy) when possible. Contact with biota may pose health hazards (e.g., stings, bites, rashes, infectious disease).

- **Not** personally mitigate an animal, pest, or weed-control problem unless they are aware of the potential hazards and are equipped to control them.

Note: To arrange for carcass removal; placement of traps; application of rodenticides, insecticides, and herbicides, contact:

- [Telecon Plus](#) (at SNL/NM)
- Maintenance Engineering (at SNL/CA)
- **Not** feed or attract **wildlife including** feral animals **and** birds.
- Avoid creating situations that could attract nuisance animals or pests. For example, work areas should be clean and free of litter, food, or debris that could attract animals and pests.
- Maintain a safe distance, and do not try to help or move injured animals. Some animals are protected by state and federal laws and may require special handling. (See “[Removal Requests](#)”). When an animal is threatening, creating a nuisance, or injured:
 - For emergencies, call 911.
 - For non emergencies at SNL/NM, call:
 - Non-emergency hotline, 311 or 844-6515.
 - During normal working hours on weekdays, call [Telecon Plus](#).
 - After hours call Incident Commanders 844-4189.



- For non emergencies at SNL/CA, 294-3724.

Note: See [Site Requirement for Interactions with Wildlife](#) for the complete text of SNL/CA's site requirements and background information.

Guidance

Members of the Workforce should:

- See CPR4001.1/MN471001, ES&H Manual, [Section 6N](#), "Biological Agents and Biosafety," for guidance on Hantavirus and clean up of rodent droppings, dead rodents, and nesting material.
 - At SNL/NM, call [Telecon Plus](#) (844-4571) to clean-up rodent debris.
 - At SNL/CA, call the [Maintenance Trouble Line \(294-6400\)](#) to clean up rodent debris.
- Consult the appropriate [Division ES&H Team](#) contact for additional guidance on feral animals and pest control.

REMOVAL REQUESTS

Requirements

Note: Consultation between DOE, Sandia, and the U.S. Fish & Wildlife Service is required before removing protected species, migratory birds, nests, eggs, or fledglings. At SNL/NM, the [ecology contact](#) has the authority to salvage migratory birds under the U.S. Fish & Wildlife permit.

When a work activity requires removal of a protected species, migratory bird, nest, eggs or fledgling, Members of the Workforce shall:

- At SNL/NM, initiate a [Telecon](#) request for removal.

- At SNL/CA, consult the [ecology contact](#).

Note: Once a removal request is made, the customer is contacted by the [ecology contact](#) to discuss the appropriate level of action.

- If removal of a protected species, migratory bird, nest, egg, or fledgling is warranted, the [ecology contact](#) initiates the removal process with DOE and the U. S. Fish & Wildlife Service.
- If removal or disturbance is **not** warranted, the ecology contact notifies the customer (e.g., in the case of a migratory bird, the customer must wait for removal to occur at the end of nesting season).

RELATED HAZARDS AND ACTIVITIES

Hazards/Activity	Reference
Construction and construction-like work	Section 4V , "ES&H for Contracted Construction and Construction-Like Activities"
Explosives operations	Chapter 9 , "Explosives Safety"
Animal, pest, or weed control	Section 6N , "Biological Agents and Biosafety"

*REFERENCES

Requirements Source Documents

16 U.S.C. § 661 et seq., *Fish & Wildlife Coordination Act*.

16 U.S.C. § 703, *Migratory Bird Treaty Act*.

16 U.S.C. § 1531, *Endangered Species Act of 1973*.

[40 CFR 171](#), *Certification of Pesticide Applicators*.

[50 CFR 10](#), *Wildlife and Fisheries*.

[50 CFR 17](#), *Endangered and Threatened Wildlife and Plants*.

[50 CFR 402](#), *Interagency Cooperation - Endangered Species Act of 1973*, as amended.

New Mexico Statutes Annotated (NMSA), 17-2-37 et seq., *Wildlife Conservation Act*.

[California Fish and Game Code](#).



Implementing Documents

SNL, [PG470224](#), *Environmental Management Operating Plan*.

SNL, [PG470110](#), *The National Environmental Policy Act (NEPA), Cultural Resources, and Sensitive Species Programs*.

SNL, [PG470216](#), *Ecological Program*.

Related Documents

42 U.S.C. § 4321 et seq., *National Environmental Policy Act of 1969*, as amended.

[DOE O 450.1, Chg. 1](#), *Environmental Protection Program*.



[DOE O 481.1B](#), *Work for Others (Non-Department of Energy Funded Work)*.

Hawaii Revised Statutes (HRS) Annotated, Title 12, Chapter 195D, "Conservation of Aquatic Life, Wildlife and Land Plants."

Nevada Revised Statutes (NRS) Annotated, Title 45, Chapter 503, "Hunting, Fishing and Trapping; Miscellaneous Protective Measures, Protection and Propagation of Native Fauna."

Nevada Revised Statutes (NRS) Annotated, Title 47, Chapter 527, "Protection and Preservation of Timbered Lands, Trees and Flora."

SNL, SAND95-1648, *National Environmental Policy Act Compliance Guide*, Attachment V, "Threatened/Endangered Species Consultation."

U.S. Fish & Wildlife Service, "[Migratory Birds Are Protected By Federal Law.](#)"

U.S. Fish & Wildlife Service, "[Endangered Species General Information.](#)"



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ES&H Manual

SECTION 10G – POTABLE WATER

Subject Matter Expert: [Annemarie Rader](#); CA Counterpart: N/A

Contributor: [Franz Lauffer](#)

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- [Applicability](#)
 - [Potable Water](#)
 - [Nonpotable Water](#)
 - [Potable Water in Remote Areas](#)
 - [Potable Water in the Field](#)
 - [Bottled Water Dispensers](#)
 - [Food Washing](#)
 - [Related Hazards and Activities](#)
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-

APPLICABILITY



For purposes of this chapter, Members of the Workforce are:

- Sandia [employees](#) working on site.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose activities include:

- Drawing [potable water](#) from the [potable water system](#) on [Sandia-controlled premises](#).
- Using permanent and nonpermanent potable water dispensers (e.g., Rubbermaid© brand containers, tanker trucks and trailers, and water tanks) at remote sites, which are not connected to a [potable water system](#) (e.g., field-location testing facilities, firing and rocket ranges, and waste sites).



POTABLE WATER

Requirements

Managers shall ensure:

- [Potable \(safe drinking\) water](#) is provided to Members of the Workforce on [Sandia-controlled premises](#) for:
 - Drinking.
 - Washing of the person.
 - Cooking.
 - Washing of cooking or eating utensils.
 - Washing of food items, food preparation surfaces, containers, equipment, utensils; and food processing facilities and premises.
- [Potable water systems](#) are protected from [nonpotable water systems](#) or systems carrying any other nonpotable substance (e.g., sewage, toxic chemicals, and petroleum-based products) by devices that prevent backflow or back siphoning.



Members of the Workforce shall report to the appropriate contact (listed in [Table 1](#)):





- Issues with potable water (e.g., taste, odor, or visible particles).
- Plans for work to be performed on a potable water system.
- Work in areas where water lines or components of a potable water system may be present.

Guidance

Members of the Workforce should report to the appropriate contact (listed in [Table 1](#)) when they:

- See a break in the potable (safe drinking) water distribution system or a water line.




Note: At SNL/NM, report water line breaks to the Non-Emergency Hotline, 844-6515. At other locations report waterline breaks to the contact listed in Table 1.

- Become aware of, or observe, any cross connects between [potable](#) and [nonpotable water systems](#). Questions concerning cross connects should be directed to the contact listed in Table 1.


Table 1. Summary of Sources for Potable (Safe Drinking) Water and the Agency Responsible for Routine Testing

Location	Potable Water Supplied By	Potable Water Routine Testing By	Agency Contact
Sandia at Albuquerque	Kirtland Air Force Base (KAFB)	KAFB	Telecon Plus 844-4571






Tonopah Test Range (TTR)	Sandia-operated water system under a permit from the State of Nevada OP472146, <i>Safe Drinking Water program at TTR</i>	TTR	O&M Environmental Manager, William E. Forston , 702-295-8124
SNL/CA	Lawrence Livermore National Laboratory (LLNL)	LLNL	Maintenance Hotline 294-6400
Kauai Test Facility (KTF)	Pacific Missile Range operated by the U. S. Navy	U.S. Navy	Pacific Missile Range, Public Works Office, Steven Hironaka, 808-335-4628



NONPOTABLE WATER

Requirements

Managers who construct nonpotable water systems that connect to a [potable water system](#), in conjunction with work or testing activities, shall ensure:

- Outlets for [nonpotable water](#) (e.g., water for industrial or firefighting purposes) are posted or otherwise marked in a manner that will indicate clearly that the water is unsafe for consumption and is **not** to be used for:
 - Drinking.
 - Cooking.
- 

- Washing:
 - The person.
 - Food.
 - Cooking or eating utensils.
 - Food preparation or processing premises.
 - Sanitary facilities (e.g., toilets, wash basins, and showers).
 - Clothes.
- [Nonpotable water systems](#) or systems carrying any other nonpotable substance are constructed to prevent backflow or back siphoning into a potable water system.



Members of the Workforce shall **not** use nonpotable water for drinking or washing any portion of the person, cooking or eating utensils, or clothing.

Guidance

[Nonpotable water](#) may be used for cleaning work premises provided that:



- The work premises are:
 - **Not** used for food processing and preparation.
 - Sanitary facilities.
- The [nonpotable water](#) does **not** contain:
 - Concentrations of chemicals that may be harmful through contact or exposure to members of the workforce cleaning or using the premises.
 - Fecal coliform.
 - Other substances that could:



- Create unsanitary conditions.
- Be harmful to Members of the Workforce.

POTABLE WATER AT REMOTE LOCATIONS

Note: This section applies to remote work locations (e.g., field-location testing facilities, firing and rocket ranges, and some waste sites) that are:

- Not connected to [potable water systems](#) at [Sandia-controlled premises](#).
- Are supplied by tanker trucks that refill a permanent water holding tank.



Requirements

Managers who have work activities in remote areas shall ensure:

- Water in storage tanks and at [potable water](#) use points are tested monthly. Consult the potable water contact listed in [Table 1](#) to arrange for testing.
- Permanent water holding tanks are replenished as scheduled.
- [Potable water](#) is ordered from the contact listed in Table 1, when water supplies run low between scheduled deliveries.
- Potable water outlets are appropriately and clearly labeled to prevent confusion with [nonpotable](#) water outlets.
 - Water at remote areas is tested at least once a month at a tap on the local distribution system.
 - Potable water storage tanks are drained, cleaned, and inspected every 3 years. ([40 CFR, Part 141](#)).



Members of the Workforce shall consult the appropriate contact listed in Table 1 for:

- Concerns about [potable water](#) color, odor, or taste.
- Questions whether water is potable or nonpotable.



POTABLE WATER IN THE FIELD

Note: This section applies to nonpermanent [potable water](#) dispensers that are taken into the field for the duration of a specific activity (e.g., Rubbermaid ©).

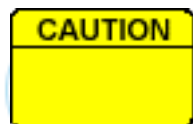
Requirements

Managers shall ensure:

- [Potable water](#) is provided in all places of employment, for drinking, washing of the person, cooking, washing of foods, washing of cooking or eating utensils, washing of food preparation or processing premises, and personal service rooms.
- Portable drinking water dispensers (e.g., jugs and kegs) are designed, constructed, and serviced so that sanitary conditions are maintained. In addition, the dispensers shall be capable of proper closure and equipped with a tap
- Open containers such as barrels, pails, or tanks for drinking water from which the water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

Members of the Workforce shall not use a common (single) drinking cup and other common (single) utensils among multiple persons.

BOTTLED WATER DISPENSERS



Bottled water dispenser reservoirs present the opportunity for significant bacterial growth. Disinfecting the reservoir helps eliminate bacterial contamination.

Guidance

Owning organizations are responsible for the maintenance of bottled dispensers. Water quality concerns, cleaning, and maintenance issues should be referred to the bottled water vendor.

FOOD WASHING



Improperly washing food items can cause or spread bacterial contamination, and spread pesticide contamination and parasites in water to be used for drinking or preparation of food items intended for human consumption.

Requirements

Members of the Workforce shall ensure that water used for washing food items comes directly from the [potable water system](#) (e.g., through a faucet).

Members of the Workforce shall **not**:

- Wash food items in sinks or containers or use utensils that are also used for laboratory operations.
 - Use the water that is left over from the washing of food items for any further purpose because its potability is doubtful.
-

RELATED HAZARDS AND ACTIVITIES

Hazards/Activities	Reference
Eating and drinking	Section 6L, "Eating and Drinking"

Responding to health concerns and emergencies	Chapter 16, "Health, Benefits, and Employee Services"
Chemical hazards	Section 6D, "Hazard Communication Standard" Section 6E, "Laboratory Standard - Chemical Hygiene Plan"

REFERENCES

Requirements Source Documents

[29 CFR 1910.141](#), *Sanitation*.

[40 CFR 141](#), *National Primary Drinking Water Regulations*.

Implementing Documents

SNL, MN470001, *ES&H Manual*, [Chapter 6](#), "Industrial Hygiene".

Related Documents

[40 CFR 143](#), *National Secondary Drinking Water Regulations*.

[DOE O 5480.4 Chg 4](#), *Environmental Protection, Safety, and Health Protection Standards*.

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

American Water Works Association, *Manual of Water Supply Practices*.

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*SECTION 10N - DISCOVERING AND REPORTING A POTENTIAL PAST WASTE RELEASE SITE

Subject Matter Expert: [Carolyn Daniel](#); CA Counterpart: [Robert Holland](#)

MN471001, Issue D

Revision Date: [November 04, 2004](#), Replaces Document Dated: January 15, 1998

Review Date: June 21, 2004

* Indicates a substantive change

- [*Applicability](#)
 - [*Discovery of a Potential Past Waste Release Site](#)
 - [*Reporting of a Potential Past Waste Release Site](#)
 - [*Related Hazards and Activities](#)
 - [*References](#)
 - *Forms
 - [SF 2001-PWR, Report of a Potential Past Waste Release Site \(Word file/ Acrobat file\)](#)
 - SF 2001-QC, Reporting SNL ES&H Concerns and Suggestions for Improvement Form ([Word file](#) / [Acrobat file](#))
-

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce who conduct outdoor activities on [Sandia-controlled premises](#) at or below ground level that **may disturb or uncover hazardous, radioactive, or mixed waste contaminants from past Sandia operations.** This section applies to historic sites, not current waste disposal locations.



*DISCOVERY OF A POTENTIAL PAST WASTE RELEASE SITE

Requirements

Managers shall be responsible for ensuring that:

- All Members of the Workforce who have knowledge about potential [past waste release sites](#) come forward with that information.
- Any reports of potential past waste release sites are reviewed with respect for the reporting person's wishes concerning anonymity.



Guidance

Members of the Workforce should:

- Be aware that a past waste release site could be present any place where Sandia has conducted operations in the past. Examples of the ways that potential past waste release sites could be found include:
 - Routine plant maintenance operations.
 - Construction activities for specific Sandia operations.
 - Routine inspection of property or testing areas.
 - Discussions with retirees.



- Close-out interviews with Members of the Workforce who are leaving Sandia.
- Make verbal or written reports of potential past waste release sites as soon as these sites are suspected or discovered. Members of the Workforce who report a potential past waste release site may remain anonymous (see "[Reporting a Potential Past Waste Release Site](#)" for more information).


*REPORTING A POTENTIAL PAST WASTE RELEASE SITE

Requirements

Members of the Workforce shall report the discovery of a potential [past waste release site](#) to management if there are Members of the Workforce working in or near the site who might be endangered.

Guidance

Members of the Workforce should report a potential [past waste release site](#) using the following methods:

Method	Action
Verbal 	<p>At SNL/NM:</p> <p>To report a potential past waste release site discovered during field work:</p> <ol style="list-style-type: none"> 1. Call the Non-Emergency Hotline (311 or 844-6515). 2. Tell the operator about the discovery. 3. Wait to hear from the ER site information contact. 4. Answer the ER site information contact's questions concerning



the site to initiate the internal ER project process for developing a potential past waste release site report.

To report a discovery of a potential past waste release site made during records searches, discussions with co-workers, or interviews at SNL/NM, contact the [ER site information](#) contact or call the Non-Emergency Hotline (311 or 844-6515).

At SNL/CA:

Consult the [ER site information](#) contact or call the ES&H Non-Emergency Hotline at 294-3724 to report any discovery of a potential past waste release site.

At TTR and all other Sandia-controlled premises:

Consult the [ER site information](#) contact for information or to report the discovery of a potential past waste release site.

Written



SF 2001 PWR, Report of a Potential Past Waste Release Site, ([Word file](#)/[Acrobat file](#)) is provided for convenience when reporting discovery of a potential past waste release site. Written reports of a potential past waste release site may be submitted to the [ER site information](#) contact.

Anonymous

Submit an SF 2001-QC, Reporting SNL ES&H Concerns and Suggestions for Improvement Form, ([Word file](#)/[Acrobat file](#)) to report anonymously, if desired. If the form is submitted anonymously, the submitter will not receive a response as to the actions taken.

*RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to past waste release sites include:



Hazards/Activities	Reference
Hazardous waste	Section 19A , "Hazardous Waste Management."
Radioactive waste	Section 19B , "Radioactive Waste Management."

Radiation protection	CPR400.1.1.32 /MN471016, <i>Radiological Protection Procedures Manual (RPPM)</i> .
Mixed waste	Section 19C , "Mixed Waste Management."
Unexploded ordinance (UXO)	SP473056, <i>Control of Unexploded Ordinance at SNL /NM Environmental Restoration Sites</i> .

*REFERENCES

Requirements Source Documents

[DOE O 440.1A](#), *Worker Protection Management for DOE Federal and Contractor Employees*.

EPA, RCRA Permit No. NM5890110518, EPA Region 6, issued to Sandia National Laboratories, Albuquerque, New Mexico.

[Compliance Order on Consent](#) between State of New Mexico, Environment Department, and the U.S. Department of Energy and Sandia Corporation.

Related Documents

[10 CFR 835](#), *Occupational Radiation Protection*.

[29 CFR 1910.120](#), *Hazardous Waste Operations and Emergency Response*.

[40 CFR 260](#), *Hazardous Waste Management System: General*.

[DOE O 5400.1](#), *Environmental Protection Plan*.

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ES&H Manual

SECTION 10U - SCRAP METAL FROM A RADIOLOGICAL AREA OR VOLUMETRICALLY CONTAMINATED METAL

Subject Matter Expert: [Terry Cooper](#)

MN471001, Issue A

Revision Date: [January 14, 2002](#), Replaces Document Dated: N/A

Administrative Change: [January 30, 2002](#)



* Indicates a substantive change

- [Applicability](#)
 - [Identification and Handling](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to activities performed on all [Sandia-controlled premises](#) that generate or manage [scrap metal](#) from a posted [radiological area](#) or [volumetrically](#)

[contaminated metal](#).

Note: Every effort should be made to ensure that [scrap metal](#) from a posted [radiological area](#) or [volumetrically contaminated metal](#) generated since June 26, 2001 is managed pursuant to this section. Scrap metal from a posted radiological area or volumetrically contaminated metal generated after the effective date of this section is subject to this section.

Specific questions on the applicability of this section should be directed to the appropriate [Division ES&H Team](#) member or the [scrap metal coordinator](#).

IDENTIFICATION AND HANDLING

Requirements

Members of the Workforce shall prevent:

- Off-site release of all [volumetrically contaminated metal](#) unless for purposes of disposal.
- Release of [scrap metal](#) from a [radiological area](#) into the reapplication system for [commercial scrap metal recycling](#).
- Release of scrap metal from a radiological area directly to an off-site area for [commercial scrap metal recycling](#).

Members of the Workforce shall be responsible for the storage or disposition of scrap metal from a radiological area or [volumetrically contaminated metal](#).

- Disposal of volumetrically contaminated metal shall follow the appropriate waste management procedures applicable to the waste classification (i.e., hazardous waste, radioactive waste, or mixed waste) in place at [Sandia-controlled premises](#).
- Disposal of scrap metal from a radiological area shall follow the appropriate waste management procedures applicable to the waste classification (i.e., hazardous waste, radioactive waste, mixed waste or solid waste) in place at [Sandia-](#)

[controlled premises.](#)

Note: Every effort should be made to ensure that disposal of scrap metal from a posted radiological area as a solid waste is at a landfill that prevents scavenging.

Guidance

Members of the Workforce should contact the appropriate [Division ES&H Team](#) member or [scrap metal coordinator](#) if they have questions on the handling, storage, or disposition of scrap metal or volumetrically contaminated metal subject to requirements in this section.

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to scrap metal include:

Hazard/Activity	Reference
Hazardous Waste	Section 19A , "Hazardous Waste Management" GN470075 , <i>Guidelines for Waste Generators at SNL/CA</i>
Mixed Waste	Section 19C , "Mixed Waste Management"
Radioactive Waste	Section 19B , "Radioactive Waste Management"
Radiation Protection	Chapter 8 , "Occupational Radiation Protection"
Recycling Material	CPR500.2.3 , <i>Property/Assets User's Manual - Identifying and Removing Excess Property</i> Section 4P , "Housekeeping"
Metallic Lead	Section 10L , "Management of Excess Metallic Lead"

REFERENCES

Requirements Source Documents

[Contracting officer direction: Memorandum from DOE/OKSO](#) to Frank A Figueroa, Vice President, Sandia National Laboratories, subject: "Moratorium and Suspension for the Release of Scrap Metals for Recycling," Dated: June 26, 2001.

Implementing Documents

[Memorandum from Frank A Figueroa](#), Vice President, Sandia National Laboratories, to Michael Zamorski, USDOE/OKSO, ref: "Zamorski/Tilton Memorandum, June 26, 2001, Moratorium and Suspension for the Release of Scrap Metals for Recycling," dated: August 2, 2001.

Related Documents

[10 CFR 835](#), "Occupational Radiation Protection".

[DOE Memorandum for Heads of Departmental Elements](#), from Secretary of Energy Bill Richardson, dated January 19, 2001, subject: Managing the Release of Surplus and Scrap Materials.

[Contracting officer direction: DOE Memorandum for Heads of Departmental Elements](#), from Secretary of Energy Bill Richardson, dated July 13, 2000, subject: Release of Surplus and Scrap Materials.

[DOE Memorandum for Heads of All Departmental Elements](#), from Secretary of Energy Bill Richardson, dated February 14, 2000, subject: Release of Materials for Re-use and Recycle.

[DOE announcement by Energy Secretary Bill Richardson](#) on release of volumetrically contaminated nickel, January 12, 2000.

[DOE 5400.5](#), Chapter VI, "General Requirements for Release of Property."

Office of Environmental Policy and Guidance Air, Water and Radiation Division, EH-412, [FACT SHEET](#), "Frequently Asked Questions on the Suspension on Release for Recycling of Metals from Radiation Areas."

[MN471016](#), *Radiological Protection Procedures Manual*.

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ES&H Manual

ATTACHMENT 11-1 – ES&H TRAINING FOR VISITORS AT SNL/CA

Subject Matter Expert: [Elsa Glassman](#); CA Counterpart: [Terry Garner](#)

Contributors: [Belinda Holley](#), [Brian Thomson](#), [Al Villareal](#)

MN471001, Issue K

Revision Date: [April 9, 2007](#); Replaces Document Dated: January 29, 2007


Review Date: February 24, 2005



* Indicates a substantive change

Note: [SNL/CA](#) has many different categories of visitors and each category requires different levels of training.

Requirements

Hosts shall determine which category fits each visitor and ensure that visitors receive the necessary [training](#). See the table below for specific information about each of the categories.

Visitor Category	Description and Requirements
 <p>1</p>	<p>This category consists of visitors who visit SNL/CA for conferences, meetings, or interviews, or to deliver or take courses. They are usually with Members of the Workforce and do not perform hands-on work. Hosts shall inform visitors of emergency procedures and any hazards the visitors may encounter.</p>

 <p>2</p>	<p>This category consists of visitors who perform hands-on work at SNL/CA facilities with SNL/CA equipment. These visitors may be unaccompanied at all times by an SNL/CA host.</p> <p>Examples of these visitors are student interns, visiting researchers, and industry partners. The host shall inform visitors of emergency procedures and any hazards the visitors may encounter.</p> <p>Category 2 visitors are further categorized as described below.</p>
<p>2A</p>	<p>This category is for visitors who are onsite for 30 days or less. Hosts shall ensure that they 2A visitors view the video titled, "Welcome to Sandia ES&H Awareness Training."</p>
<p>2B</p>	<p>This category is for visitors who are onsite for more than 30 days. Hosts shall ensure that 2B visitors:</p> <ul style="list-style-type: none"> • View the video titled, "Welcome to Sandia ES&H Awareness Training." • Attend California Site Specific ES&H Awareness (ESH100C).
 <p>3</p>	<p>This category includes people who are contract and or service personnel visiting SNL/CA to repair copy machines, calibrate instruments, service vending machines, or perform other service or maintenance work on equipment located at SNL/CA. Hosts shall inform visitors of emergency procedures and any hazards the visitors may encounter.</p>

Guidance

SNL/CA managers should maintain documentation that explains the rationale for any exceptions to the requirements stated above.



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ES&H Manual

ATTACHMENT 11-2 – LINE-MANAGED TRAINING STANDARDS

Subject Matter Expert: [Deborah Espinosa](#); CA Counterpart: [Terry Garner](#)

Contributors: [Belinda Holley](#), [Elsa Glassman](#), [Linda Wilson](#)

MN471001, Issue K

Revision Date: [April 9, 2007](#); Replaces Document Dated: January 29, 2007

Review Date: February 24, 2005

* Indicates a substantive change

- [Applicability](#)
 - [Systematic Training Approach](#)
 - [Responsibilities](#)
 - [Line-Managed Training Development Level Decision Tool Process](#)
 - [Line-Managed Training Development Level of Rigor Categories](#)
 - [Requirements for Development of Line-Managed Classroom Training](#)
 - [Requirements for Development of Line-Managed On-the-Job Training \(OJT\)](#)
 - [Line-Managed Training Documentation Minimum Requirements](#)
 - [Instructor Qualification Process for Classroom and OJT Instructors](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

The applicability of this attachment ([Line-Managed Training Standards](#)) is as follows:

- This attachment is applicable to both [Program-Managed](#) and Organization-Managed training. All requirements herein apply to both and all references herein to organization, organization manager, line-managed, etc. apply to both.
- This attachment applies to all [line-managed training](#) which is not required to adhere to 5480.20A, Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities and/or DOE O 470.1, Safeguards and Security Program.
- This attachment is intended for those managers and/or personnel who have the responsibility for developing or overseeing organization training and [training programs](#).
- This attachment is applicable to vendor training which is developed and/or instructed for members of SNL organizations.
- For the purposes of this attachment, [line-managed training](#) is defined as "Any training that teaches the knowledge and/or skills needed to safely and effectively function within a specific line working environment and is not managed by Corporate Learning and Professional Development (CL&PD) and is not considered [program-managed training](#)."
- If CL&PD consults with the line about [line-managed training](#) and/or develops line-managed training, the CL&PD consultant will adhere to the [Line-Managed Training Development Level Decision Tool](#) and this attachment.
- Formal evaluation of [training](#) and [training programs](#) is outside the scope of this document. For information related to evaluation of training programs, refer to "Guidelines for Evaluation of Nuclear Facility Training Programs," DOE-STD-1070-94, U.S. Department of Energy.
- Requirements and guidance related to the development of organization apprenticeship programs and mentoring programs is outside the scope of this document.

SYSTEMATIC TRAINING APPROACH

Requirements

The requirements in the *ES&H Manual*, [Chapter 11](#), ES&H Training, were derived from, but not necessarily directed by, Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities, DOE O 5480.20A, U.S. Department of Energy. As a result, SNL has implemented a [graded approach](#) for organization-managed training development based on the systematic approach to training as referenced in DOE O 5480.20A.

Note: This attachment provides a [graded approach](#) which will allow organizations to both determine the level of rigor at which to develop line-owned training and determine the level of formality of documentation related to line-owned training. These determinations will be made by the organization manager based on his/her knowledge of the organization's needs and requirements.

According to DOE O 5480.20A, "initial and continuing training programs shall be established to ensure that operating organization personnel are [qualified](#) to perform job requirements. This shall be achieved by using a systematic approach to training."

The systematic approach to training used by SNL is derived from the following guidance:

- A Systematic Approach To Training, [DOE-HDBK-1078-94](#), U.S. Department of Energy
- Alternative Systematic Approaches to Training, [DOE-HDBK-1074-95](#), U.S. Department of Energy
- Guide to Good Practices for OJT, [DOE-HDBK-1206-98](#), U.S. Department of Energy
- Guide to Good Practices for Training and Qualification of Instructors, [DOE-HDBK-1001-96](#), U.S. Department of Energy

Consequently, the systematic approach to training used by SNL for classroom based

training includes the following five elements: analysis, design, development, implementation and evaluation. The systematic approach used by SNL for [on-the-job training \(OJT\)](#) includes the following six elements: preparation, introduction, explanation, demonstration, practice under supervision, and review/evaluate/conclude.

Managers of organizations shall ensure this systematic approach to training is adhered to using the [graded approach](#) as described in this attachment. The graded approach includes the following two components:

- Determining the level of rigor at which to develop line-owned training
- Determining the level of formality of documentation related to line-owned training

Determining the level of rigor at which to develop line-owned training

The organization determines whether the [training](#) falls into one of three training development categories:

- High level of rigor in training development
- Medium level of rigor in training development
- Low level of rigor in training development

To determine which rigor category to adhere to, the organization manager shall ensure adherence to the [Line-Managed Training Development Level Decision Tool](#). The Line-Managed Training Development Level Decision Tool is to be used for both classroom and [on-the-job \(OJT\) training](#). Requirements for each level of rigor are described in this attachment.

Determining the level of formality of documentation related to line-owned training

The organization determines the level of documentation formality necessary to meet the minimum requirements for training documentation; consequently, the organization manager shall be responsible for determination of the level of formality at which the required training documents will be developed.

RESPONSIBILITIES


Requirements

The organization manager shall ensure that the following items are performed:

- Utilizing the organizational risk assessment or similar criteria in defining the terms significant, moderate, and low when using the Line-Managed Training Development Level Decision Tool.
- Addressing the level of risk and consequences specific to the organization when determining which level of rigor category the training is developed to using the Line-Managed Training Development Level Decision Tool.
- Following any internal approval and/or sign-off processes for determining which level of rigor category at which the training will be developed.
- Revising/updating [line-managed training](#) to accommodate and address changes in the organization's mission, environment or regulatory requirements.
- Meeting the minimum requirements for [line-managed training](#) documentation.
- Maintaining all documentation and related materials for the [line-managed training](#).
- Determining and documenting, using internal organization processes, exemption requirements for waiving established training requirements for those personnel with previous experience or qualifications.
- Vendor developed training and instruction adhere to the [Line-Managed Training Standards](#) requirements (for example, one option might include incorporating the Line-Managed Training Standards requirements into the vendor contract).

The Corporate Leadership and Professional Development (CL&PD) Technical and Compliance Training manager shall ensure that the following items are performed:

- Providing organizations with a decision tool to determine the level of rigor at which [line-managed training](#) is developed (Line-Managed Training Development Level Decision Tool).

- 
- Providing organizations with guidance in interpreting the [Line-Managed Training Standards](#) (i.e. this attachment).
 - Assisting in clarifying the systematic approach to training (SAT) and related requirements.
 - When requested, assisting organizations in all phases of the training development process (both classroom and [OJT](#)) on a charge-back basis.
 - Providing opportunities for [instructor qualification](#) through Basic Instructor Training ([BIT100](#)) and On-the-Job Training ([OJT100](#)).
-



LINE-MANAGED TRAINING DEVELOPMENT LEVEL DECISION TOOL PROCESS

Requirements

The organization manager shall ensure that the [Line-Managed Training Development Level Decision Tool](#) is used to assist in determining which level of rigor the training will be developed to. Upon determining a high, medium or low level of rigor, the organization manager shall ensure that the requirements located in this attachment for each level of development rigor are adhered to.

When using the Line-Managed Training Development Level Decision Tool, there may be some cases where the training has components which fall into more than one rigor category. In this case, the organization manager shall ensure that the level of risk and consequences specific to the organization are addressed and take responsibility for determining which level of rigor category to place the training within.




LINE-MANAGED TRAINING DEVELOPMENT LEVEL OF RIGOR CATEGORIES

Requirements

High Level of Rigor

If one or more of the following apply to the [training](#), develop to a high level of rigor:

- 
- Organization-specific Regulatory requirements
 - Civil and/or criminal prosecution, fines
 - DOE Quality Assurance requirements (e.g., QA rule), Price Anderson Amendments Act (PAAA) enforcement
 - Significant risk to SNL mission or reputation
 - Significant environmental impacts, requirements, regulations, or emission controls
 - Significant health hazards, risk of personnel injury/illness
 - Significant property, equipment or facility damage
 - Significant security/safeguards risks
 - Significant use of hazardous materials, equipment or tools
 - Significant impact on national security
 - Other significant organization-specific risks and consequences

For training developed at a high level of rigor, the organization manager shall ensure training is conducted by a [qualified](#) instructor. Refer to the [Instructor Qualification Process](#) located in this attachment.

Medium Level of Rigor

If one or more of the following apply to the [training](#), develop to a medium level of rigor:

- 
- Moderate risk to SNL mission or reputation

- Moderate environmental impacts, requirements, regulations or emission controls
- Moderate health hazards or risk of personnel injury/illness
- Moderate property, equipment or facility damage
- Moderate security/safeguards risks
- Moderate use of hazardous materials, equipment or tools
- Moderate impact on national security
- Other moderate organization-specific risks and consequences



For training developed at a medium level of rigor, the organization manager shall ensure training is conducted by a [qualified](#) instructor. Refer to the [Instructor Qualification Process](#) located in this attachment.

Low Level of Rigor

If one or more of the following apply to the [training](#), develop to a low level of rigor:

- Low or non-existent risk to SNL mission or reputation.
- Low or non-existent environmental impacts, requirements, regulations or emission controls
- Low or non-existent health hazards or risk of personnel injury/illness
- Low or non-existent property, equipment or facility damage
- Low or non-existent security/safeguards risks
- Low or non-existent use of hazardous materials, equipment or tools
- Low or non-existent impact on national security
- Other low or non-existent organization-specific risks and consequences



Training developed to a low level of rigor does not require [instructor qualification](#).

The following table provides a summary for comparing the criteria for the three levels of rigor:

Criteria	Level of Rigor		
	High	Medium	Low
Organization-specific Regulatory requirements	Significant Moderate Low		
Civil and/or criminal prosecution, fines	Significant Moderate Low		
DOE Quality Assurance requirements (i.g. QA rule), Price Anderson amendments Act (PAAA) enforcement	Significant Moderate Low		
Risk to SNL mission or reputation	Significant	Moderate	Low or non- existent
Environmental impacts, requirements, regulations, or emission controls	Significant	Moderate	Low or non- existent
Health hazards, risk of personnel injury/illness	Significant	Moderate	Low or non- existent
Property, equipment, or facility damage	Significant	Moderate	Low or non- existent
Security/safeguards risks	Significant	Moderate	Low or non- existent
Use of hazardous materials, equipment or tools	Significant	Moderate	Low or non- existent
Impact on national security	Significant	Moderate	Low or non- existent

Other organization-specific risks and consequences	Significant	Moderate	Low or non-existent
Required Instructor Qualification	Yes	Yes	No

REQUIREMENTS FOR DEVELOPMENT OF LINE-MANAGED CLASSROOM TRAINING

Requirements

Classroom training is defined as “Training presented to groups of various sizes, typified by stand-up lecture, seminar, or group interaction.” Classroom instruction works well for presentation of fundamental and basic theoretical knowledge (Ref. A Systematic Approach to Training, DOE-HDBK-1078-94, U.S. Department of Energy).

The organization manager shall ensure the following:

- For a high level of rigor, classroom training is conducted by a [qualified](#) instructor.
- For a medium level of rigor, classroom training is conducted by a [qualified](#) instructor.
- For a low level of rigor, no formal SNL instructor qualification is required.

Level of Rigor for Classroom-Based Training Required Tasks:

The organization manager shall ensure that the required systematic approach to training tasks for development of line-managed classroom training are followed for each level of rigor as stated in the following table:

Table Note: A colored block indicates the tasks to be completed. Dark grey is a required task; Light grey is a recommended/best practice.

Systematic Approach to Training Tasks	Level of Rigor		
	High	Medium	Low

Analysis			
Determine training needs			
Define audience			
Develop a job and/or task analysis			
Select tasks for training			
Prepare a task-to-training matrix			
Conduct a task analysis			
Design			
Determine pre-requisites			
Write terminal & enabling objectives			
Develop evaluation standards tied to objectives			
Develop test items			
Develop course outline and obtain appropriate approval signatures (if required by organization)			
Evaluate course design			
Development			
Select training methods			
Develop lesson plan			
Develop training support materials			
Conduct pilot			
Evaluate pilot feedback and make revisions (as necessary)			
Implementation			
Communication regarding the training			
Ensure appropriate instructor qualifications			
Conduct training			
Conduct student evaluation			
Document and maintain training program and student training records			
Evaluation			
Monitor evaluation indicators and feedback			
Analyze program evaluation information			
Make necessary revisions and corrective actions			
Required Instructor Qualification			

REQUIREMENTS FOR DEVELOPMENT OF LINE-MANAGED ON-THE-JOB TRAINING (OJT)

Requirements

[On-the-Job Training \(OJT\)](#) is defined as “Formal training that is conducted and evaluated in the work environment.” OJT has the advantage of providing continuous training on tasks that are of immediate need to the trainee. OJT can continue for whatever length of time is necessary for the trainee to achieve mastery. OJT is limited to those situations where it is administratively possible to conduct the training and where OJT can be conducted without interference to ongoing facility operations. Training that meets the following conditions should be considered for OJT:

- Assignment of trainees can be made in small groups and spread over a sufficiently long period of time.
- There are no critical resource (manpower, material, facility availability) constraints in the facility, and multiple training conditions can be provided in the job environment.
- For high or medium level of rigor training development, [qualified](#) instructors are available to conduct OJT.

If the tasks meet all the guidelines listed above, they should be considered for [OJT](#). If one or more of the guidelines are not met, the tasks should be considered for assignment to an alternative training setting (For examples of alternative settings refer to “Alternative Systematic Approaches to Training,” [DOE-HDBK-1074-95](#), U.S. Department of Energy).


The organization manager shall ensure the following:

- For a high level of rigor, [OJT](#) is conducted by a [qualified](#) instructor.
- For a medium level of rigor, [OJT](#) is conducted by a [qualified](#) instructor.
- For a low level of rigor, no formal SNL instructor qualification is required.

Level of Rigor for OJT-Based Training Required Tasks

The organization manager shall ensure that the required systematic approach to training ([OJT Six-Step Process](#)) tasks for development of [line-managed OJT](#) are followed for each level of rigor as stated in the following table:

OJT Six-Step Process	High and Medium Level of Rigor (REQUIRED TASKS)	Low Level of Rigor (RECOMMENDED TASKS)
Step 1: Preparation	Instructor adequately prepares prior to conducting OJT to ensure consistent and effective training	Instructor adequately prepares prior to conducting OJT to ensure consistent and effective training
Step 2: Introduction	Put the trainee at ease, motivate trainee interest in session, explain training objectives, give overview of task, stress safety measures and compliance to procedures, gauge trainee's knowledge level, minimize training distractions	Put the trainee at ease, motivate trainee interest in session, explain training objectives, give overview of task, stress safety measures and compliance to procedures, gauge trainee's knowledge level, minimize training distractions
Step 3: Explanation	Explain how to do the task, explain technical terms, encourage two way communication, use questioning techniques to determine understanding, explain in sequential pattern, relate material to what trainee already knows	Explain how to do the task, explain technical terms, encourage two way communication, use questioning techniques to determine understanding, explain in sequential pattern, relate material to what trainee already knows

 <p>Step 4: Demonstration</p>	<p>Show and explain how to perform task, demonstrate complete task and then trainee practices or demonstrate task using steps allowing trainee to perform each step after demonstrated, stress safety and compliance with procedures, use questioning techniques to determine understanding, continue demonstration until trainee understands</p>	<p>Show and explain how to perform task, demonstrate complete task and then trainee practices or demonstrate task using steps allowing trainee to perform each step after demonstrated, stress safety and compliance with procedures, use questioning techniques to determine understanding, continue demonstration until trainee understands</p>
 <p>Step 5: Practice Under Supervision</p>	<p>Closely supervise trainee to ensure safety and correct performance, have trainee verbalize main steps of task, use questioning technique to determine understanding, allow trainee to practice at their own pace, schedule sufficient time for practice, correct errors</p>	<p>Closely supervise trainee to ensure safety and correct performance, have trainee verbalize main steps of task, use questioning techniques to determine understanding, allow trainee to practice at their own pace, schedule sufficient time for practice, correct errors</p>
 <p>Step 6: Review, Evaluate, Conclude</p>	<p>Review learning objectives and task steps, explain what the trainee did well and did not do well during the practice session, reinforce and motivate the benefits of the training to the trainee, evaluate trainee's performance, document the evaluation and training following organization specific OJT documentation procedures</p>	<p>Review learning objectives and task steps, explain what the trainee did well and did not do well during the practice session, reinforce and motivate the benefits of the training to the trainee, evaluate trainee's performance, document the evaluation and training following organization specific OJT documentation procedures</p>
<p>Required Instructor Qualification</p>	<p>Yes</p>	<p>No</p>

LINE-MANAGED TRAINING DOCUMENTATION MINIMUM REQUIREMENTS

Requirements

The Line-Managed Training Standards provide minimum documentation requirements for all [line-managed training](#); however, it is the organization's responsibility to determine at what level of formality to develop the required documentation based on internal management decisions, organizational risk, desired level of audit trail, etc.

Organization managers shall be responsible for determining the level of formality at which the required training documents are developed. Organization managers shall ensure maintenance of all [line-managed training](#) documents and related materials consistent with SNL, DOE and any other organization specific requirements.

The following are examples of level of formality for [training](#) documentation:

- For classroom training, a high level of formality for critical topics may include a formal analysis document or formal design document; however, a lower level of formality for less critical topics may include a brief description document of the training analysis or design.
 - For a comprehensive description and information related to the elements and documentation of a formal systematic approach to training refer to “A Systematic Approach to Training,” [DOE-HDBK-1078-94](#) , U.S. Department of Energy.
 - For information regarding the minimum elements and documentation for a systematic approach to training refer to “Alternative Systematic Approaches to Training,” Appendix D, [DOE-HDBK-1074-95](#), U.S. Department of Energy.
- For [OJT](#), a high level of formality for critical procedures may include development of a formal [lesson plan](#) for the [OJT Six-Step Process](#) tasks; however, a lower level of formality for less critical procedures may include an operating procedure (OP) enhanced with instructor notes.

As referred to above, the minimum documentation requirements for all [line-managed training](#) are stated here.

The organization manager shall ensure that the following documentation requirements (as a minimum) for all [line-managed training](#) are performed:

- Obtaining and documenting appropriate internal management approval signatures related to the training and determining the development level of rigor per organization approval requirements.
- Developing/maintaining documentation related to tasks required for the systematic approach to classroom-based training.
- Developing/maintaining documentation related to tasks required for the systematic approach to OJT ([Six-Step Process](#)).
- Developing/maintaining documentation of individual training completions to provide audit trail and to demonstrate that individuals have been trained.
- Developing/maintaining documentation of qualification/certification records and requirements, including any [exceptions](#) and/or exemptions.
- Determining any additional training related documentation based on organization-specific requirements and level of audit trail necessary to fulfill organization-specific needs (i.e., qualification cards, reading and signing of technical work documents or laboratory notebooks, etc.).
- Developing/maintaining documentation of [exceptions](#) and/or exemption requirements for waiving established training requirements for those personnel with previous experience or qualifications.

In developing training documentation it may be helpful to learn more about the components of the systematic approach to training. This information, along with job aids, can be located on the [CL&PD Training Standards & Procedures](#) website by clicking the links below:

- [Instructional System Design \(ISD\) Process](#) (also known as a systematic approach to training)

- [Analysis](#)
- [Design](#)
- [Development](#)
- [Implementation and Managing Courses](#)
- [Evaluating Training Programs](#)
- [Classroom Lesson Plan Template](#)
- [OJT Six-Step Process Template](#) (In process of being placed on CL&PD S&P under Instructor Qualification link)

INSTRUCTOR QUALIFICATION PROCESS FOR CLASSROOM AND OJT INSTRUCTORS

Requirements


SNL uses the following definition for [instructor qualification](#): “The process of determining and verifying that individuals meet the instructional and technical competence qualification criteria for a specific instructor qualification level (Guide to Good Practices for Training and Qualification of Instructors, [DOE-HDBK-1001-96](#), U.S. Department of Energy).”

For classroom-based and [OJT](#)-based training developed to a high or medium level of rigor, the organization manager shall ensure that the training [instructor](#) is [qualified](#) per SNL requirements. SNL requirements for [instructor qualification](#) include the following two components:

- The organization manager shall ensure that the [instructor](#) has the appropriate technical [competence](#) using organization-specific processes to make this determination.


- The CL&PD manager shall ensure that the [instructor](#) has the appropriate instructional [competence](#) using the CL&PD [instructor qualification](#) process as described below.

Classroom Instructors: A [classroom instructor](#) shall be [qualified](#) in at least one of the following three ways:

- 
- Successful completion of MIT-III (DOE course)
 - Successful completion of [BIT100](#) (SNL course)
 - Observation and evaluation of instructional skills by a CL&PD BIT100 instructor

After completion of one of the three options above, the [qualified](#) instructor candidate shall complete the [Instructor Qualification Certificate form](#). The organization manager shall complete and sign Part I of the form verifying the instructor's technical [competence](#), the CL&PD consultant shall complete Part II of the form verifying successful completion of BIT100, while the CL&PD manager shall sign Part III of the form. The original signed form shall be provided to the BIT100 lead instructor for inclusion into the CL&PD qualified instructor database. A copy of the signed form shall be kept in the organization's file with the course documentation.

OJT Instructors: An [OJT instructor](#) shall be [qualified](#) in at least one of the following two ways:

- 
- Successful completion of [OJT100](#) (SNL course)
 - Observation and evaluation of instructional skills by a CL&PD OJT100 instructor

After completion of one of the two options above, the [qualified](#) instructor candidate must complete the [Instructor Qualification Certificate form](#). The organization manager shall complete and sign Part I of the form verifying the instructor's technical [competence](#), the CL&PD consultant shall complete Part II of the form verifying successful completion of OJT100, while the CL&PD manager shall sign Part III of the form. The original signed form shall be provided to the OJT100 lead instructor for inclusion into the CL&PD qualified instructor database. A copy of the signed form shall be kept in the organization's file with the course documentation.

If an outside vendor instructs a course determined to require a high or medium level of

rigor, the [line-managed training](#) manager shall ensure that the vendor instructor adheres to the same teaching principles as SNL qualified instructors are expected to adhere to for either classroom-based or on-the-job training. For more information regarding teaching principles adhered to by SNL qualified instructors, refer to the following resources:

- [Classroom Instructor Evaluation Criteria Form](#)
 - [OJT Instructor Evaluation Criteria Form](#)
-

REFERENCES

Implementing Documents

[DOE-HDBK-1078-94](#), *A Systematic Approach to Training*.

[DOE-HDBK-1074-95](#), *Alternative Systematic Approaches to Training*.

[DOE-HDBK-1206-98](#), *Guide to Good Practices for OJT*.

[DOE-HDBK-1001-96](#), *Guide to Good Practices for Training and Qualification of Instructors*.

[DOE O 5480.20A](#), *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.

Related Documents

[DOE O 470.1](#), *Safeguards and Security Program*



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ES&H Manual

*SECTION 12B - OFFSITE SHIPMENT AND TRANSPORT OF HAZARDOUS MATERIAL

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* Indicates a substantive change

- [Applicability](#)
 - [Training](#)
 - [Offsite Shipment and Transport](#)
 - [Responding to Packaging and Transportation Emergencies](#)
 - [Related Hazards and Activities](#)
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APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose activities involve the [offsite shipment](#) of [hazardous material](#) that has **not** been determined to be waste.

Note: In addition to various contacts cited throughout this section (e.g., for consultation regarding requirements), attachments 12A-1 through 12A-6 provide additional resources of information on a variety of relevant topics at specific sites where Sandia work is performed.

Site-Specific Applicability

See Section 12A, "Onsite Packaging and Transportation (P&T) of Hazardous Material," [Table 1](#), "Site-Specific Applicability," for site-specific applicability of these requirements at remote sites.

Exceptions to Applicability

This section does **not** apply to [offsite shipments](#) of hazardous, radioactive, or mixed waste. Waste shipments are performed exclusively by hazardous waste management organizations at SNL/NM, SNL/CA, and TTR.

TRAINING

Requirements

Managers and Members of the Workforce shall comply with the training requirements stated in Section 12A, "Onsite Packaging and Transportation (P&T) of Hazardous Material," topic "[Training](#)."

Members of the Workforce who are responsible for packaging/transporting [hazardous material](#) shall:

- Complete required refresher training or equivalent training that meets or exceeds the substantive content of any required PKX course.
- For equivalent refresher training, submit training documentation to the [packaging and transportation training contact](#) for approval.
- Following approval, have the organization training coordinator enter completion of

equivalent training in the corporate training, education, and development system (TEDS).

OFFSITE SHIPMENT AND TRANSPORT

Requirements

Managers shall be responsible for ensuring that all [offsite shipments](#) of [hazardous material](#) are performed or authorized by a Sandia shipping organization **only**. Consult the [Sandia shipping organization contact](#) for additional information and assistance.

Members of the Workforce shall:

- **Not** ship hazardous material offsite, by hand carry, mail, vehicle, or otherwise, except as authorized by a Sandia shipping organization.
- Use the electronic [Web Shipper](#) (SNL/NM and SNL/CA) to initiate all hazardous material shipments.
- Comply with [Section 12A](#), “Onsite Packaging and Transportation (P&T) of Hazardous Material,” as applicable, to transport hazardous material to [onsite](#) shipping locations.

Note: Members of the Workforce who misrepresent the contents or the hazardous nature of a shipment may be held liable for civil or criminal penalties.

Guidance

Members of the Workforce who have questions or concerns about [offsite shipments](#) should consult the [Sandia shipping organization contact](#).

RESPONDING TO PACKAGING AND

TRANSPORTATION EMERGENCIES



Requirements

Members of the Workforce who are involved in a transportation or handling incident that involves [hazardous material](#) shall follow the requirements stated in Section 12A, "Onsite Packaging and Transportation (P&T) of Hazardous Material," topic, "[Responding to Packaging and Transportation Emergencies](#)."

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to packaging and transportation of [hazardous material](#) include:

Hazard/Activity	Reference
Accountable nuclear material transportation	<p>CPR400.3.14, <i>Management of Accountable Nuclear Material</i>.</p> <p>SNL/NM-MC&A 97-0900, <i>Nuclear Material Custodian Procedures Manual</i> (applies to all sites except SNL/CA).</p> <p>SAND 83-8036C, <i>Nuclear Material Operations Manual</i> (applies only to SNL/CA).</p>
Authorization basis process	Section 13C , "Authorization Basis Process."
Biological agents	Section 6N , "Biological Agents and Biosafety."
Emergencies	Chapter 15 , "Emergency Preparedness and Management."
ES&H Events	Chapter 18 , "Reporting, Investigating, and Correcting ES&H Events."

<p>Explosive material</p> 	<p>DOE M 440.1-1, <i>DOE Explosives Safety Manual</i>.</p> <p>Chapter 9, “Explosives Safety.”</p> <p>Kirtland Air Force Base regulations (consult the appropriate Division ES&H Team for assistance).</p> <p>DoD requirements (consult the appropriate Division ES&H Team for assistance).</p>
<p>Federal motor carrier safety regulations</p>	<p>FMCSR Compliance Manual and Drug and Alcohol Policy Statement.</p> <p>CPR400.1.1.17/GN470084, <i>Complying With Federal Motor Carrier Safety Regulations</i>.</p>
<p>Nuclear criticality safety</p>	<p>CPR400.1.1.11/GN470072, <i>Nuclear Criticality Safety</i>.</p>
<p>Onsite transportation of classified hazardous material</p> 	<p>SNL/NM-CMPC-96-7442-01, <i>Classified Material Control Procedures Manual</i> (applies to all sites except SNL/CA).</p> <p>CPR400.3.12, <i>Management of Classified Matter</i>.</p> <p><i>Classified Procedures Manual</i> (applies only to SNL/CA).</p>
<p>Radioactive material</p>	<p>CPR400.1.1.32/MN471016, <i>Radiological Protection Procedures Manual</i>.</p>
<p>Technical work documents (TWDs)</p>	<p>Chapter 21, “Technical Work Documents (TWDs).”</p>

REFERENCES



Requirements Source Documents and Websites

[49 CFR 171](#), *General Information, Regulations, and Definitions*:

- [49 CFR 171.15](#), *Immediate Notice of Certain Hazardous Materials Incidents*.
- [49 CFR 171.16](#), *Detailed Hazardous Materials Incident Reports*.

[49 CFR 172](#), *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements*:

- [49 CFR 172.704](#), *Training Requirements*.

[149 CFR 173](#), *Shippers—General Requirements for Shipments and Packagings*.



[IATA](#), International Air Transport Association.

Implementing Documents

SNL, CPR400.1.1.17/[GN470084](#), *Complying With Federal Motor Carrier Safety Regulations*.

SNL, CPR400.1.1.32/[MN471016](#), *Radiological Protection Procedures Manual*.

SNL, CPR400.1.1.31/[MN471011](#), *Explosives Safety Manual*.

SNL/CA, SAND 83-8036C, *Nuclear Material Operations Manual*.

SNL/NM-CMPC-96-7442-01, *Classified Material Control Procedures Manual*.



SNL/NM-MC&A 97-0900, *Nuclear Material Custodian Procedures Manual*.

Related Documents

[49 CFR 100 – 185](#), *Research and Special Programs Administration, Department of Transportation* (except 171, 172, 173, and 177).

[49 CFR 173](#), *Shippers—General Requirements for Shipments and Packagings*.

[49 CFR 177](#), *Carriage by Public Highway*.

- [49 CFR 177.848](#), *Segregation of Hazardous Materials*.

[DOE O 460.1B](#), *Packaging and Transportation Safety*.

[DOE O 460.2](#), *Departmental Materials Transportation and Packaging Management*.

[DOE O 461.1](#), *Packaging & Transfer or Transportation of Materials of National Security Interest*.

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ES&H Manual

SECTION 13E - RISK CRITERIA FOR FLIGHT VEHICLE OPERATIONS

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- [Applicability](#)
 - [Quantifying Hazards](#)
 - [Assessing Hazards and Risks](#)
 - [Launching Rocket and Flight Systems](#)
 - [Related Hazards and Activities](#)
 - [References](#)
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to Members of the Workforce whose activities include flight vehicle

operations and rocket motor systems tests at Sandia operated ranges and facilities (TTR, KTF, and Technical Area III), as well as Sandia flight systems flown on non-Sandia test ranges (e.g., White Sands Missile Range, and Alaska Aerospace Development Corporation-Kodiak Launch Complex).

The criteria covered by this section applies to:



- Aeronautical system testing.
- Air-to-air missiles.
- Air-to-surface missiles.
- Anti-satellite missiles.
- Ballistic missiles.
- Cruise missiles.
- Debris generated by endoatmospheric and exoatmospheric missile intercepts.
- Rocket systems.
- Space launch vehicles.
- Surface-to-air missiles.
- Unmanned aircraft.

This section does **not** apply to Members of the Workforce who generate debris during training operations or from orbiting spacecraft other than targets.

The Integrated Safety Management System (ISMS) systematically integrates safety into management and work practices at all levels so that missions are accomplished while protecting the worker, the public, and the environment (this is known as the "safety objective"). ISMS software provides a consistent and standard process for addressing hazards and environmental issues across the laboratories. The Risk Management Program encompasses the following processes:



- Hazards identification and classification (see Section 13A, "Hazards Identification

and Classification Process").

- Hazards analysis (see Section 13B, "Hazards Analysis Process").
- Authorization basis documentation (see Section 13C, "Authorization Basis Process").
- Readiness review (see Section 13D, "Readiness Review Process").

The National Environmental Policy Act (NEPA) process is used for identification, analysis, and documentation of potential impacts to the animal and cultural elements of the environment that may be affected by flight vehicle operations. (See Section 10B, "National Environmental Policy Act (NEPA), Cultural Resources, and Historic Properties," and Section 10C, "Migratory Birds and Protected Species.") These processes determine the hazard classification for an activity and provide information for the granting of authorization to operate in accordance with DOE and Sandia requirements.

QUANTIFYING HAZARDS

Requirements

Managers shall **be responsible for ensuring** that a flight safety analysis is performed to quantify hazards to the public, participating test personnel, and facilities.

Note: A flight safety analysis may include:

- An impact dispersion study for unguided systems such as sounding rockets (e.g., Strypi rocket system).
- Detailed probabilistic risk assessment studies for guided systems (e.g., **the Sandia Strategic Target System [STARS]**).

ASSESSING HAZARDS AND RISKS

Requirements

Managers shall be responsible for ensuring that:

- All flight operations that create flying debris, intended or non-intended, follow a hazard assessment and risk management approach as specified in the DoD Range Commanders Council (RCC)/Range Safety Group (RGS) [Standard 321-02, Common Risk Criteria for National Test Ranges](#) *Subtitle: Inert Debris*, and illustrated in the following table.

SUMMARY OF COMMON CRITERIA		
Maximum Acceptable Probability	Undesired Event	Duration
1E-6	Individual Fatality (General Public)	One Year
1E-7	Individual Fatality (General Public)	One Mission
3E-5	Total Fatalities (General Public)	One Mission
1E-3*	Total Fatalities (General Public)	One Year
3E-5	Individual Fatality (Mission Essential)	One Year
3E-6	Individual Fatality (Mission Essential)	One Mission
1E-2*	Total Fatalities (Mission Essential)	One Year
3E-4*	Total Fatalities (Mission Essential)	One Mission
1E-7	Non-Mission Aircraft	One Mission
1E-6	Mission Essential Aircraft	One Mission
1E-6	Non-Mission Ships	One Mission
1E-5	Mission Essential Ships	One Mission

1E-7	Manned/Mannable Spacecraft	One Revolution
*Advisory requirements		

- The probability of rendering inoperative all or a major part of a permanent facility will be less than 1×10^{-3} per facility per test operation.



LAUNCHING ROCKET AND FLIGHT SYSTEMS

Requirements

Managers shall be responsible for ensuring that the following actions occur prior to launching rockets or flight systems from SNL ranges (including both Sandia and non-Sandia rocket systems) from SNL locations or prior to launching any Sandia rocket or flight system from a non-SNL range:

- The flight dynamics technology group manager reviews the hazard analysis.
- The flight dynamics technology group manager prepares a cover memo or letter to:
 - The appropriate Sandia manager stating that all quantitative limits with respect to casualty expectation to the public and participating test personnel, as well as damage to permanent facilities have been met.
 - The range commander of the appropriate national test range stating that the proposed rocket operation meets the RCC/RSG Standard 321-02, *Common Risk Criteria for National Test Ranges, Subtitle: Inert Debris*, and requesting formal range safety approval from the host range.

Note: Include recommendations, qualifications, or other issues as appropriate.

- A range safety approval (RSA) signed by the range commander is in place.

Note: While the RCC/RSG risk criteria is considered a recommended practice for all member ranges, the range commander of each national test range can issue a

waiver to the established criteria. For **Sandia**, the equivalent range commander is the **Sandia** range manager, center director, or division vice president, depending on the hazard level.

Managers shall ensure that a similar process is applied to other hazardous flight operations that do not involve rockets, such as gliding bombs and unmanned aerospace vehicles (UAVs).

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to flight vehicle operations include:

Hazard/Activity	Reference
Aircraft operations	Section 4U , "Aviation Safety."
Explosives	CPR400.1.1.31/MN471011 , <i>Sandia Explosives Safety Manual</i> .
Noise	Section 6H , "Noise Exposure and Hearing Conservation."
Pressure	CPR400.1.1.27/MN471000 , <i>Pressure Safety Manual</i> .

REFERENCES

Requirements Source Documents

Range Commanders Council (RCC)/Range Safety Group (RSG) [Standard 321-02](#), *Common Risk Criteria for National Test Ranges, Subtitle: Inert Debris*.

RCC/RSG [Supplement to Standard 321-02](#), *Common Risk Criteria for National Test Ranges, Subtitle: Inert Debris*.

Range Commander's Council, [CSTE-DTC-WS-RCC](#), *Organization and Policy Document*, April 2000.

Related Documents

SNL, [SAND97-0805](#) *Hazards of Falling Debris to People, Aircraft, and Watercraft.*

SNL, [SP473511](#), *Risk/Consequence Assessment and Management Approval Process for Aerospace Systems Development Center Rocket Operations and Sandia National Laboratories (U).*



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ES&H Manual

SECTION 19E – TREATABILITY STUDIES FOR HAZARDOUS AND MIXED WASTE

Subject Matter Expert: [Phyllis K. Peterson](#); CA Counterpart: [Janet Harris](#)

MN471001, Issue E

Issue Date: October 6, 1997

Revision Date: [September 30, 1997](#); Replaces Document Dated: July 31, 1995

- [*Applicability](#)
 - [**Notifications](#)
 - [**Contracts](#)
 - [**Possible Constraints](#)
 - [*References](#)
-

* Indicates a substantive change

** Indicates a substantive addition

*APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.
- Sandia contractors as specified in [Section 1B](#), "What Is the Scope."

This section applies to all activities involving laboratory-scale studies on hazardous or

mixed waste, or providing waste for treatability studies internal or external to SNL.

****NOTIFICATIONS**

Requirements

At least 90 days prior to the anticipated [treatability study](#) start date, Members of the Workforce proposing to request or conduct a [treatability study](#) shall notify the [Treatability Study Corporate Coordinator](#) contact.

Members of the Workforce shall submit to the coordinator a [treatability study](#) description that contains the following information:

- The organization requesting the study
- The organization conducting the study
- The technology being investigated
- The purpose of the [treatability study](#), and if successful, how the process or processes will benefit [treatment](#) of hazardous or mixed waste
- The type and quantity of hazardous or mixed waste to be treated
- Why surrogate waste samples are not appropriate
- Expected start and completion dates
- The proposed disposition of sample residues or unused samples

Members of the Workforce shall follow the written instructions provided by the [Treatability Study Corporate Coordinator](#) contact, including instructions regarding records that must be maintained and requirements that must be met.

Guidance

Members of the Workforce may contact the [Treatability Study Corporate Coordinator](#) contact for assistance in meeting the requirements associated with treatability studies.

****CONTRACTS**

Guidance

Members of the Workforce may contact the [Treatability Study Corporate Coordinator](#) for guidance in preparing and reviewing the treatability contract.

****POSSIBLE CONSTRAINTS**

Guidance

Possible constraints to [treatability studies](#) include: ul>

- Proposed [treatment](#) site credentials (EPA identification number and audit results)
 - Acceptability of the proposed technology for a [treatability study](#)
 - Weight restrictions limiting quantity of waste stored on site for treatability studies
 - Weight restrictions limiting quantity of waste shipped or treated in a [treatability study](#)
 - Time restrictions regulating the duration of the proposed study
-

***REFERENCES**

Requirements Source Documents

20 NMAC 4.1, *Hazardous Waste Management*, New Mexico Administrative Code.

40 CFR 261, *Identification and Listing of Hazardous Waste*.



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ATTACHMENT 21-2 – GUIDELINES FOR WRITING STEP-BY-STEP INSTRUCTIONS

Subject Matter Experts: [Lynn Fondren](#); CA Counterpart: [Donn Wright](#)

Contributor: [Steve Coffing](#)

MN471001, Issue D

Revision Date: [June 22, 2006](#); Replaced Document Dated: February 25, 2004

This attachment provides guidance on the following for procedures that require actions be performed in sequential order"

- [Example](#)
- [Rules of thumb](#)
- [Note, caution, warning, and danger statements](#)

Example

Emergency Procedure		
In the event of an emergency, follow these steps		
Step	Action	
1	Alert others.	
2	Leave the danger area.	
3	Obtain/apply first-aid or medical assistance as necessary:	
	Emergency	
	Medical assistance	911
	Fire	911
	Security	911

4	Notify persons identified as building points of contacts (e.g., building owner).
5	Assist emergency response personnel.
6	Notify your department manager. If unavailable, notify another manager within your center.
7	Manager (or delegate) notifies the facility manager/designee (for occurrences).



Rules of Thumb

- Before writing a procedure, it may be helpful to diagram the process using a [flowchart](#). Check new procedures and modifications to existing procedures by "walking" through them to ensure that they are workable, and the order of steps conforms to the normal operating sequence.
- Consult with technical reviewer(s) and your [Division ES&H Team](#) early in the draft stages of writing procedures to reduce problems and prevent delays.
- Make sure the steps are consistent with ES&H requirements, technically accurate, and understandable.
- Whenever practical, include information from applicable source documents (for example, facility design documents, safety analysis documents, and vendor manuals).
- Specify limits or tolerances, and be sure they are consistent with instrument capabilities.
- Specify component or system restoration requirements. (For example, specify the sequence of steps necessary to bring the system back into safe operation after repairs, maintenance, or modifications.)
- Take into account the design of the facility.
- Use only one verb per action.
- Use specific terms and keep required decision making by the user to a minimum.
- Provide a level of detail that allows for:

- User experience, training, and skill (the less familiar the user is, the more instructions should be provided).
- Complexity of the task (as task complexity increases, the level of detail should increase).
- Consequences of error (as consequences of performance error increase, so should the detail and provisions for verification—for example, a check by another person to ensure that an important step has been performed correctly).
- Frequency of performance (the more frequently a job is performed, the less detail is needed in a document at the work site).

- Use active rather than passive voice (for example: "close the valve" instead of "the valve should be closed").

- Use the simplest word that fits the meaning:

- "Stop" rather than "immobilize"
- "Use" rather than "utilize"
- "Method" rather than "methodology"

- Avoid unnecessary words (for example: "...tornadoes, a possible source of high winds").

- Use "when" to introduce a condition that is expected to occur after certain activities have occurred (for example: "When the water level reaches the scribe line...").

- Use "if" to introduce a condition that may or may not occur because of variable starting conditions or unknown parameter rates of change (for example: "If the pump pressure decreases to less than 120 psig...").

- Avoid using "or equivalent" when referring to equipment or material. Instead, whenever practical, list specific equipment or materials that are equivalent, or state the criteria that equivalent equipment or material must meet.

- Avoid using ambiguous words or phrases, such as the following:


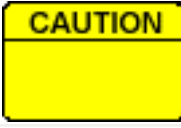


- Tightly or loosely
- Suitable, suitably, or suitability
- As needed, or as necessary
- Use direction
- Limited
- Sufficiently
- Thin or thick
- Snugly
- Firmly
- In accordance with good workmanship
- Properly
- Approximately
- Securely
- Adequate or adequacy
- As required
- Systematic inspection
- Frequent inspection
- Small or large
- Good engineering practice



- Scientifically accepted standards

Note, Caution, Warning, and Danger Statements

To clearly identify note, caution, warning, and danger statements, consider the following icons:

Icon	Purpose
 Note:	Provide supplemental information to help users make decisions or improve task performance
 Caution:	Indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury . It may also be used to alert against unsafe or costly practices.
 Warning:	Indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury .
 Danger:	Indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury . This signal word is to be limited to the most extreme situations.

Follow these rules for notes, caution, danger, and warning statements:

- Position caution, danger, and warning statements so that they appear immediately before the action step(s) to which they apply.
- Position notes before or after the information to which they apply, whichever position is most beneficial to the reader.
- Place statements ahead of notes whenever these items are used at the same point.
- Do not include action steps in statements.



- Number notes if using more than one note at the same location.
 - Keep statements short and concise, and frame them as indicative statements rather than commands to distinguish them from action steps.
 - Include only one topic in each statement.
 - Avoid overuse.
-



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ATTACHMENT 21-3 – OPTIONAL METHODS OF DOCUMENT CONTROL

Subject Matter Experts: [Lynn Fondren](#); CA Counterpart: [Donn Wright](#)

Contributor: [Steve Coffing](#)

MN471001, Issue D

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The following methods are listed from most formal to least formal.

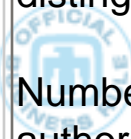


Method 1

The ES&H Document Control Center (DCC) can release your procedure through its document control system. This method is free, convenient, and makes it easy for people to find out what procedures have already been written and to request copies of those procedures to possibly adapt for use within other organizations. Call the [ES&H Document Control Center \(DCC\) contact](#) early on in the procedure development process for more information.

Method 2

Identify each procedure with a stamp or other marking to identify it as an original belonging to a particular organization. This allows users to determine that they are using an original, controlled procedure, not an outdated photocopy. Most organizations do not use color photocopy machines, so this is a simple way to distinguish originals from photocopies.



Number each controlled original consecutively, and assign numbered originals to authorized users. Upon receipt of a controlled procedure, the authorized user signs and returns a receipt for it or signs and returns the outdated version with the receipt. This ensures that the new procedure has been received and the outdated version has been taken out of use. Distribution may be tracked through a database or log.

Method 3

Distribute procedures with a distribution list of authorized users attached to the procedure. Upon receipt, each authorized user initials the master list, which is kept and maintained by the document control administrator (appointed by the manager). Distribute or post a monthly listing of all current procedures to enable users to ensure they are using the most current version. The document control administrator tracks distribution through a database or log.

Method 4

Distribute procedures with a distribution list attached to the procedure. The document control administrator or other appointed person verifies (at least yearly) that SNL personnel are using current procedures. The document control administrator tracks distribution through a database or log.

Method 5

Post the procedure online and notify SNL personnel who use the procedure through e-mail messages that list the URL on Sandia's Internal Web or a local area network. Recipients acknowledge receipt by replying to the e-mail message, and the document control administrator logs these responses. The document control administrator could also track distribution by logging e-mail receipts that are sent automatically when recipients open the e-mail messages.



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ES&H Manual

*SECTION 22B - ROOT CAUSE ANALYSIS (RCA)

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Contributor: [Chris Tolendino](#)

MN471001, Issue C

Revision Date: [September 23, 2004](#); Replaces Document Dated: December 4, 2001

Review Date: August 16, 2004

Administrative Changes: [March 9, 2006](#)

* Indicates a substantive change

- [Applicability](#)
 - [*Performing a Root Cause Analysis](#)
 - [Related Hazards and Activities](#)
 - [*References](#)
 - Attachments
 - [*22B-1 - Causal Analysis Tree \(CAT\)](#)
 - [*22B-2 - Principles and Methods for Collecting Information During Root Cause Analysis](#)
 - Forms
 - SF 2001-AWS, Root Cause Analysis Worksheet ([Word file](#)/[Acrobat file](#))
-

APPLICABILITY

For purposes of this document, Members of the Workforce are:

- Sandia employees.

- Contractor employees as specified in [Section 1B](#), "What Is the Scope."

This section applies to **Members of the Workforce who are involved with [root cause analyses \(RCAs\)](#)** of [reportable occurrences](#) (see [Section 18C](#), "Occurrence Reporting") and nuclear safety rule [nonconformances](#) (see [Section 18G](#), "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances").



*PERFORMING A ROOT CAUSE ANALYSIS

Requirements

[Facility manager/designees](#) shall be responsible for ensuring that an RCA is performed when:

- Compiling the data for a final occurrence report in accordance with [Section 18C](#), "Occurrence Reporting," or [Section 18G](#), "Identifying, Reporting, and Correcting Nuclear Safety Rule Nonconformances."
- **Organizations need to:**



- Understand the sequence of contributing [events](#) that led to a situation.
- Determine the [causal codes](#) for the situation. (For cause codes, see [Attachment 22B-1, "Causal Analysis Tree \[CAT\]."](#))
- **Validate the causes.**
- Propose [corrective actions](#) for the causes and other undesired elements/components to mitigate similar undesired situations.
- Evaluate lessons learned to improve operations.
- Address nuclear safety nonconformances (see [Section 18G](#), "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances"), as applicable.



Facility manager/designees shall be responsible for ensuring that:

- A graded approach is used with the RCA and that the severity and risk associated with the occurrence or condition are used when determining the level of effort to be expended on the investigation into the causes of the occurrence.
- The appropriate analysis process is used (see the root cause analysis website, "Tools," for assistance in this determination).
- Relevant information is collected, as appropriate, according to Attachment 22B-2, "Principles and Methods for Collecting Information During Root Cause Analysis," and Section 18C, "Occurrence Reporting."



Guidance

The RCA process may also be useful for non-occurrence trackable events (NOTEs) and other situations that could have significant impact on future activities if not mitigated. For example:

- Observations or deficiencies noted during management surveillances. See CPR400.1.1.4/GN470034, *Performing and Documenting Management Surveillances*, for requirements and guidance associated with management surveillances.
- Deficiencies or trends discovered by line ES&H self-assessments. (See Section 22A, "ES&H Self-Assessment Activities.")
- Performance indicator trends.
- Non-Occurrence Trackable Events (NOTEs), injuries, or releases to the environment that are not subject to occurrence reporting requirements or to PAAA reporting requirements (see Section 18G, "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances").
- Findings or recommendations from:
 - Internal, independent ES&H appraisals.

- External audits or appraisals.

Members of the Workforce who are assigned to an RCA should be familiar with the following when investigating the event:

- [DOE-STD-1004-92](#), *Root Cause Analysis Guidance Document*.
- The list of root cause analysts, guidance, and tools that are available from the ES&H Performance Assurance, Occurrence Management, root cause analysis [website](#).

RELATED HAZARDS AND ACTIVITIES

Hazards and activities related to RCAs include:

Hazard/Activity	Reference
Emergency preparedness and management	Chapter 15 , "Emergency Preparedness and Management."
ES&H self-assessments	Section 22A , "ES&H Self-Assessment Activities."
Hazard identification and analysis	Section 13B , "Hazards Analysis Process."
Occurrence reporting	Section 18C , "Occurrence Reporting."
Reporting nuclear safety rule nonconformances	Section 18G , "Identifying, Reporting, and Correcting Nuclear Safety Nonconformances."
Safety analysis	Section 13C , "Authorization Basis Process."

*REFERENCES

Requirements Source Documents

[DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*.

[DOE O 231.1A](#), *Environment, Safety, and Health Reporting*.

Implementing Documents

SNL, [Occurrence Management Program](#).

Related Documents

[DOE-STD-1004-92](#), *Root Cause Analysis Guidance Document*.

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Chapter Contents](#)

[Forward to
Next Section](#)



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ES&H Manual

SECTION 22D – CORRECTIVE ACTION DEVELOPMENT, VERIFICATION OF COMPLETION, AND VALIDATION OF EFFECTIVENESS

Subject Matter Expert: [Chris Tolentino](#); CA Counterpart: N/A

Contributors: [Kerry Sturgis](#), [Frank Alton](#), [Suzanne Weissman](#), [Francine Vigil](#), [Gordon Smith](#), [Ina Frazier](#)

MN471001, Issue A

Revision Date: [December 20, 2005](#); Replaces Document Dated: N/A

Administrative Changes: [March 17, 2006](#)

*Indicates a substantive change

- [Applicability](#)
- [Purpose](#)
- [Training and Qualifications](#)
- [Processes](#)
- [References](#)

Attachments

- [22D-1](#) - Corrective Action Verification of Completion and Validation of Effectiveness Flowchart
- [22D-2](#) - Corrective Action Tracking Tool
- Forms
 - SF2001-RCA - Root Cause Analyst Qualification Form ([Word file](#)/[Acrobat file](#))



APPLICABILITY

This section applies to Members of the Workforce who develop, verify completion of, or validate effectiveness of corrective action(s).

For the purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
 - Sandia contractors as specified in [Section 1B](#), “What Is the Scope.”
-

PURPOSE

The purpose of this document is to integrate the requirements for verification and validation of corrective actions resulting from events such as audits, self-assessments, occurrences, and /Price-Anderson Amendments Act (PAAA) Nuclear Safety Rule nonconformance. Utilizing this guidance will ensure consistent development, verification of completion and validation of effectiveness of corrective actions across programs and projects.

The goals for developing beneficial corrective actions include: correcting a problem, preventing recurrence of the specific problem, and precluding occurrence of similar problems.

TRAINING AND QUALIFICATIONS

Well written corrective actions are critical for correcting problems and ensuring that they do not recur. Corporate [causal analysis](#) training provides guidance on developing corrective actions. This training is broken out into two levels:



Level 1: This training is for Members of the Workforce who need to perform root cause analyses/causal analyses of simple events/findings (i.e., audit findings and self-assessment findings, SSO surveillance findings, etc.). It also includes those who will participate on root cause analysis teams, but not lead them or serve as a root cause analyst. This level of training is presented on the Root Cause/Causal Analysis [website](#) and the specifics are outlined as follows (Members of the Workforce should review all of the following):

- Purpose.
- Value.
- Application.
- Analyze Finding or Observation.
- Develop Corrective Actions.
- Definitions.
- Causal Analysis Results.
- Causal Analysis Methods.
- Causal Analysis Pitfalls.
- Writing Corrective Actions.

Level 2: This training is for Members of the Workforce who need to perform root cause analyses/causal analyses on more complex events/findings (i.e., occurrence reports, PAAA Nuclear Safety Rule). See qualification criteria in Attachment 1, Root Cause Analysts Qualification Form

The requirements table below indicates who is required to take causal analysis training.

Table 1 - Causal Analysis Training Requirements

Program	Level 1 Training	Level 2 Training
Occurrence Reporting ESHM Section 18C	--	Root Cause Analysts ¹
Nuclear Safety Rules (PAAA) – NTS ESHM Section 18G	--	Root Cause Analysts ¹
Self-Assessments ESHM Section 22A	Finding owner or delegate	--
Corrective Action Management Program (CAMP)	CAMP Project Lead	--
ES&H Issues Management	ES&H Issues Management Review Committee Chair	--
12870	--	--

¹Anyone who plans to perform an OR or NTS causal analysis and isn't already a qualified Root Cause Analyst must qualify with Level 2 requirements.

Note 1: Completion of this training must be entered into TEDS.

Note 2: Those who attended one of the May 20-22, 2003, DOE/HQ-sponsored causal analysis training sessions are automatically qualified to perform Occurrence Reporting causal analyses (see TEDS FMD102 for a list of those people).

Corrective Action Development, Verification of Completion and Validation of Effectiveness

Requirements

The manager who owns corrective actions from events (e.g., occurrences, PAAA Nuclear Safety Rule), findings (e.g., internal or external audits), or self-assessments, is responsible for ensuring that:

- A team is organized, includes a causal analyst trained at the appropriate level, to

perform the causal analysis at the appropriate level of rigor and develop corrective actions (see Table 2 below for training requirements).

- Corrective actions are written. CAs written pertains to the documenting of the CA. Completed is the process of completing the action stated in the CA.
- Corrective actions identified in the written document are completed.
- Corrective actions are effective.
- Corrective action evidence is stored appropriately.
- Corrective action evidence is made available to the appropriate program personnel or Division ES&H coordinator as designated in the following table.
- Changes in the scope of a corrective action must be approved through SNL management and the appropriate oversight personnel.



See [Attachment 1](#), Corrective Action Verification of Completion and Validation of Effectiveness Flowchart, to view the complete process.

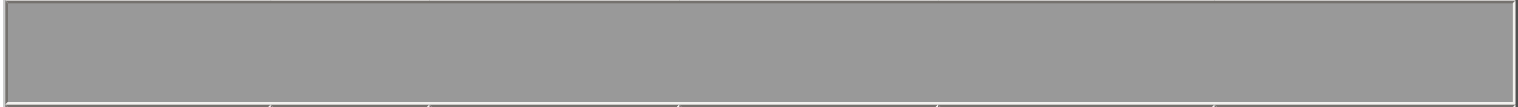
Table 2 indicates the programs that require verification of corrective action completion and validation of corrective action effectiveness. It also designates who ensures that the verification or validation of corrective actions is performed.



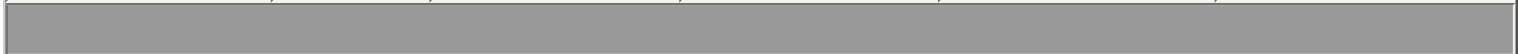
Table 2 – Corrective Action Verification of Completion and Validation of Effectiveness Requirements

Program		Verification of Completion		Validation of Effectiveness	
	Risk Level1	Requirement	Responsible Individual for ensuring performance of Verification	Requirement	Responsible Individual for ensuring performance of Validation

Occurrence Reporting (corrective action)					
OR levels OE, SC1, SCR	High	100% independent verification	Senior Manager in organization that owns the Occurrence	100% validation	Senior Manager in organization that owns the Occurrence
SC2	Medium	Sampling	Senior Manager in organization that owns the Occurrence	Optional	Senior Manager in organization that owns the Occurrence
SC3, SC4, NOTE	Low	Optional	Senior Manager in organization that owns the Occurrence	Optional	Senior Manager in organization that owns the Occurrence



PAAA Nuclear Safety Rules— Issues reported into NTS (corrective action)	--	100% verification	Owning organization manager	100% validation	Owning organization manager
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PAAA Nuclear Safety Rules– Issues reported into local system (corrective action)	--	100% verification	Owning organization manager	Recommended	Owning organization manager
ES&H Issues Management (corrective action)	High	100% independent verification	Senior Manager	100% validation	Senior Manager
Corrective Action Management Program (CAMP) (corrective action)	High	100% independent verification	Senior Manager	100% validation	Senior Manager
	Medium	N/A	Senior Manager	Sampling	Senior Manager
	Low	N/A	CAMP Project Lead - Red1	Optional	CAMP Project Lead-White ¹
ES&H Quality, and Safeguards & Security Assessments, Dept. 12870 (corrective action)	High	Sampling	12870 Assessors	Optional	Division ES&H Coordinator

1 See ES&H Risk Management [Concept](#)

2 Nuclear Safety Rule (PAAA) requires that corrective action evidence be sent to the SNL PAAA office, MS 0361.



PROCESSES

Developing Corrective Actions

Corrective actions shall be derived from the causal analyses – once the cause(s) of the incident have been determined, write corrective actions to correct those causes and prevent reoccurrence of the incident in the future.

Note: For those programs requiring validation of effectiveness, the last corrective action must state that “validation of corrective action effectiveness will be performed.” See the “Validation of Corrective Action Effectiveness” section in this document for more information.

For 12870 Quality, Safeguards and Security Assessments, follow the requirements at the [12870 website](#).

Corrective Action Content

When developing proposed corrective actions, focus on solutions that shall:

1. Prevent recurrence.
2. Be feasible.
3. Meet organizational and corporate goals.
4. Be consistent with ES&H and other safety-related constraints.
5. Not introduce new risks.

Writing Corrective Actions

When writing corrective actions Members of the Workforce should:

- Use the active voice (not passive) for corrective action statement(s).
- Identify only one action for each corrective action statement.
- Identify specifically who will take the action.



- Ensure the proposed action specifically addresses the cause of the incident.
- Identify the mechanism for tracking actions to completion.
- Define the acceptance criteria for the action being taken; what is the discrete end point of the corrective action
- Describe how the corrective action will be monitored and/or measured to determine the effectiveness regarding the specific incident(s).
- Talk to the auditor, if an audit finding is poorly written or vague and attempt to determine the specifics.
- Write the corrective actions to address the true intent of the finding, even if that intent is not crystal clear in the finding statement.

Note: If it is not known for sure if the finding can be addressed within the available time constraints, budget and authority, a corrective action such as the following can be written: “The feasibility of “X” will be investigated.” However, don't use this mechanism to delay completion of a corrective action.

Members of the Workforce should Also consider:

1. If the corrective action(s) address all causes identified in the causal analysis?

Note: For Occurrence Reports (ORs), DOE requires a corrective action statement for each item (i.e., each causal factor) that has been assigned an apparent cause code.

2. If the corrective action(s) cause adverse impacts?
3. If training will be required as part of the implementation?
4. In what time frame can the corrective action(s) be implemented?
5. What resources are required for successful implementation and continued success of the corrective actions?
6. Is the implementation of the corrective actions measurable? How will you know



that the corrective actions are effective?

7. Performing independent verification or validation of corrective actions. Randomly select several incidents for audit (sampling). Have a Member of the Workforce who is not directly involved with the incident audit the corrective action file to ensure that all corrective actions have been completed and that they were effective in preventing recurrence.



Corrective Action Effectiveness

Below is a list of questions to assist in determining if proposed corrective actions will be effective in preventing recurrence. Preventing recurrence is the mechanism for determining if a corrective action is effective.

Note: Compare corrective action(s) to the conditions below:

1. Comprehensive – what has/will be done to correct the cited problems as well as similar problems in related systems?
2. Actions to prevent recurrence – what changes will be made to systems/processes to help prevent this or a similar problem from occurring in the future?
3. Measured – how will management verify that the corrective actions are effective?
4. Monitored - how will management verify that the corrective actions continue to be effective?



Evidence of Completion

Once corrective actions have been written and completed, Members of the Workforce shall take the following steps to ensure that the corrective action evidence is adequate:

1. Review programmatic requirements to ensure compliance.
2. Ensure evidence is in physical form, examples include:
 - Causal analysis
 - Corrective action plan



- Corrective action closure
- Correspondence
- E-mails
- Memos
- Revised documentation
- Photos
- Drawings



3. Store evidence:

- Evidence shall be stored according to programmatic and corporate records management requirements. Store evidence in a corporate management records center or WebFileShare.
- >Evidence shall have an identifier (is there a corporate standard for identifiers?) on it linking back to the specific event.
- Shall document (is there a corporate mechanism?) where the evidence is stored. (Follow individual programmatic processes for this step.)
- Designate a contact that can locate and provide the evidence.
- For 12870 Quality, Safeguards and Security assessments, Members of the Workforce shall follow the requirements at the [12870 website](#).

Verification of Corrective Action Completion

Verification of corrective action completion is performed to ensure compliance with programmatic requirements. Generally, an independent verification should be completed. Guidance is provided, below, for those programs that require “independent verification:”

1. Formality of Verification - the verification of completion may be done using a [graded approach](#) or according to programmatic requirements.

- 
2. Verification of Completion Timeframe - the verification of completion should be performed within approximately six months of implementation of the corrective action. This verification may be performed during annual self-assessments, management surveillances and walk-throughs. If a timeframe is designated and required by a program (i.e., PAAA Nuclear Safety Rules , ES&H Issues Management, 6300 CAMP, Self Assessments, 12870 Quality, Safeguards and Security Assessments), verification should be performed to those requirements. For those Occurrence Reporting corrective actions that require independent verification, see the [OR Model](#).
3. Sampling - a sampling is a review of selected cases, usually 10-50% of the total number of corrective actions, to determine if they are complete. A sampling could be “random” or “block” (e.g., check every third or tenth event). If there are less than 10 corrective actions, consider reviewing the most important ones (how are the most important determined?). For example, the following two corrective actions, might be considered important enough to review:
- a) Required changes to the ES&H Manual; or
 - b) ES&H Manual changes need to be communicated to members of the workforce.
- 
4. Independent Verification of Completion - “Independent” means that an objective person will review the evidence of completion for each corrective action and sign-off that the item is complete. An objective person is someone who can review corrective actions and make an unbiased determination as to whether the item has been completed in an adequate manner. Members of the Workforce from within the division may independently verify corrective actions. Divisions may develop their own process or use these optional SNL corporate guidelines.
- a) When performing independent verification:
 - Keep each event in a separate file and add background and supporting documentation to the file as it becomes available.
 - Mark the date of completion and add the evidence supporting completion of that corrective action to the file for that event or finding, as each corrective action is completed.
 - Organize the file and attach the evidence of completion to each corrective

action, when the last corrective action has been completed and evidence collected.

- Appoint an objective Member of the Workforce to review each corrective action and the evidence of completion and verify that the item is actually complete. Collect additional supporting evidence, if necessary, and add it to the file. Clearly document the results of the verification process so that auditors can easily see the evidence of completion.
- Place files in one of Sandia's corporate records management centers or on WebFileShare. Retain records according to the [Sandia Records Retention and Disposition Schedule](#).
- Report or submit corrective action evidence and verification to the program representative. This is required for the following programs: PAAA and Nuclear Safety Requirements, ES&H Issues Management, and the Corrective Action Management Program (CAMP). For 12870 Quality, Safeguards and Security Assessments, follow the requirements on the [12870 website](#).



Validation of Corrective Action Effectiveness

Note: When is Validation of Effectiveness required? Check individual programmatic requirements in Table 2, (e.g., [Occurrence Reporting](#), [PAAA](#) and Nuclear Safety Requirements, Self-assessments, CAMP, ES&H Issues Management, 12870) to ensure compliance. Otherwise, validation of effectiveness should be done on a routine basis as designated by each Division ES&H/S&S Coordinator.

1. Formality of Validation - the evaluation of effectiveness may be done on a graded basis or according to programmatic requirements:
 - For high significance or risk associated (see [Table 2](#)) with the event, 100% validation must be performed.
 - For less serious events, a sampling should be performed.
2. Validation of Effectiveness Timeframe - perform a validation of corrective action effectiveness within approximately six months after completion. This validation may be performed during annual self-assessments, management surveillances,



and walk-through(s).

3. Validation Process - divisions may develop their own process or use the SNL corporate guidelines described below. Divisions may assess their own corrective actions using Members of the Workforce from within the division. Be sure to check individual programmatic requirements to ensure compliance.
4. Ineffective corrective action – when performing validation and it is determined that a corrective action was ineffective the causal analysis must be reviewed or performed again to redefine the appropriate corrective action to control or resolve the problem. Once the corrective action is redefined and implemented, validation shall be performed again. Validation of the redefined corrective action constitutes closure of the validation process.

5. Documentation and Closure:



- Collect additional supporting evidence, if necessary, and add it to the file, once each corrective action has been validated. Clearly document the results of the validation process so that auditors can easily see the evidence. The files must be placed in one of Sandia's corporate records management centers or on WebFileShare. Retain according to the [Sandia Records Retention and Disposition Schedule](#).
- Report corrective action validation of effectiveness to the program representative. This is required for the following programs: PAAA Nuclear Safety Requirements, ES&H Issues Management, and 6300 CAMP. For 12870 Quality, Safeguards and Security Assessments, follow the requirements at the [12870 website](#).



REFERENCES

Requirements Source Documents

[DOE M 231.1-2](#), *Occurrence Reporting and Processing of Operations Information*.

SNL, CPR400.1.1/MN471001, *ES&H Manual*, [Section 18C](#), - *Occurrence Reporting*.

SNL, CPR400.1.1/MN471001, *ES&H Manual, [Section 18G](#), - Identifying, Reporting and Correcting Nuclear Safety Nonconformances.*

SNL, CPR400.1.1/MN471001, *ES&H Manual, [Section 22A](#), - ES&H Self-Assessment Activities.*

SNL, [CPR 400.1.3](#), *Price-Anderson Amendments Act (PAAA) and Nuclear Safety Requirements.*

Corrective Action Management Program ([CAMP](#)).

Related Documents

[DOE G 450.4-1B](#), *Integrated Safety Management System Guide.*

[DOE N 231.1](#), *Environment, Safety, and Health Reporting Notice, 1/15/02.*

[DOE O 414.1A Chg 1](#), *Quality Assurance.*

[DOE O 210.1, Chg. 2](#), *Performance Indicators & Analysis of Operations Information, 9/27/95.*

[DOE O 450.1](#), *Environmental Protection Program, 1/15/03.*

[DOE 5480.19](#), *Conduct of Operations Requirements for DOE Facilities, Chg. 2, 7/9/90.*

[CPR001.3.2](#), *Corporate Quality Assurance Program.*

[CPR001.3.4](#), *The Corporate Work Process (CWP).*

[CPR001.3.3](#), *Formality of Operations Manual.*

[CPR001.3.5](#), *Audits, Assessments and Appraisals.*

[PLA04-12](#), *ES&H & Emergency Management Functional Area Self-Assessment Plan.*

Environmental Safety and Health Self-Assessment Process.

Lockheed-Martin Corporate Energy, Environment Safety and Health.

Corporate Functional Procedure No:ESH-10

Effective: 11/15/03

Revision: Original

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ES&H Manual

SECTION 22E – ENVIRONMENT, SAFETY, AND HEALTH AND EMERGENCY MANAGEMENT CORRECTIVE ACTION MANAGEMENT PROGRAM (CAMP)

Subject Matter Expert: [Frank Alton](#)

MN471001, Issue B

Revision Date: [August 2, 2006](#); Replaces Document Dated: January 11, 2006



*Indicates a substantive change

- [Applicability](#)
- [Purpose](#)
- [Scope](#)
- [CAMP Objectives](#)
- [Ownership](#)
- [*Roles and Responsibilities](#)
- [*Corrective Action Management Program](#)
- [References](#)
- Attachments
 - [22E-1](#) - Corrective Action Plan (CAP) Template
 - [22E-2](#) - Causal Codes (CPR001.3.11)
 - [22E-3](#) - CAMP Process for ES&H Findings/Observations/OFIs
 - [22E-4](#) - CAMP Process for OA Findings
 - [22E-5](#) - CAMP Flowchart for ES&H Issues Management Review Process
- Forms
 - SF2001-CAC - Corrective Action Change Request Form ([Word file](#)/[Acrobat](#))



[file](#))

APPLICABILITY

For the purposes of this document, Members of the Workforce are:

- Sandia [employees](#).
- Sandia contractors as specified in [Section 1B](#), “What Is the Scope.”

This section applies to Members of the Workforce who are involved with [Corrective Action Plans \(CAPs\)](#) and the [Corrective Action Management Program \(CAMP\)](#).

PURPOSE

The ES&H [Corrective Action Management Program](#) is the corporate process for resolving ES&H [findings](#), [observations](#), and [opportunities for improvement \(OFI\)](#) assigned to all Sandia National Laboratories facilities (e.g., SNL/NM, SNL/CA, TTR) as a result of [surveys](#) or [audits](#). [CAMP](#) defines requirements for implementing the [Corporate Corrective Action Process](#). [CAMP](#) outlines the development, review, and approval process for ES&H-related corrective action plans.

SCOPE

[CAMP](#) guides the ES&H finding owners to resolve [findings](#) in a timely, effective, and consistent manner. [CAMP](#) identifies the responsibilities for reporting, tracking, and closing findings. It sets requirements in the development of the initial [CAP](#) to include the [verification of corrective action completion](#) of the CAP.



CAMP OBJECTIVES

The objectives of the [Corrective Action Management Program](#) are to:

- Develop a robust, consistent, and effective CAMP process.
- Provide guidance in the development of effective corrective and preventive actions that are timely, tracked to completion, and verified as **completed**.
- Provide a process for resolution of ES&H [findings](#).
- Provide a closing and [verification](#) process.
- Provide a formal process to change due dates of corrective actions/milestones.
- Identify ownership and accountability of ES&H findings.

OWNERSHIP

The ES&H Performance Assurance Department is responsible for updating this document. It shall be reviewed at least once every two years, or when necessary.

*ROLES AND RESPONSIBILITIES

*Finding CAP Owner

- Ownership is assigned within the owning organization to the appropriate management level.
- Develops and documents preliminary and updated [CAPs](#).
- Revises CAP corrective actions/milestones through the formal [change control board](#) process.

- Is accountable for the CAP and for meeting corrective action/milestone due dates.
- Coordinates *ES&H Manual* and Supplements changes with *ES&H Manual* Information Management Team (IMT).
- Reviews monthly reports provided by *ES&H Assurance, Planning & Behavior Based Safety* Department on opened/closed [findings](#).
- Notifies [CAMP Project Lead](#) when corrective action/milestone or CAP is completed by providing copies of evidence submitted with memo to DOE requesting closure.
- Verifies *completion of Corrective Actions in the* CAP 90 days after completion of last corrective action/milestone.
- Attends monthly meeting, if needed, on the third Thursday of the month to discuss late [OA](#) corrective actions/milestones with DOE Headquarters (teleconference).

Responsible Manager

- One level above finding [CAP](#) owner.
- Ensures a proper finding owner is identified.
- Ensures overdue corrective actions/milestones are appropriately addressed.
- Briefs next level of management on late due dates of corrective actions/milestones.
- Applies resources, if needed, to CAP corrective actions/milestones.
- Monitors implementation of CAP.
- Verifies [evidence packages](#) as completed before they are submitted for closure of corrective actions/milestones.
- Ensures *[verification](#) for completion of Corrective Actions* is conducted.
- Reviews monthly status reports progress on opened/closed findings.

- Attends [Change Control Board](#) meetings when changes occur to CAP.

Subject Matter Expert (SME) or CAP Team Member

- Participates in [CAP](#) development.
- Generates and completes one or more of the corrective actions/milestones.
- Ensures appropriate documented evidence is submitted to the [CAMP Project Lead](#) for closure of corrective actions/milestones.
- Supports a causal analysis.
- Analyzes problems/causes necessitating a corrective action/milestone.

CAMP Project Lead

- Manages [CAMP](#) process for [CAPs](#).
- Manages the ES&H Corporate [Corrective Action Tracking System \(CATS\)](#).
- Verifies [evidence packages](#) submitted.
- Serves as the single point of contact on resolution of findings.
- Monitors, tracks, and reports status of [findings](#).
- Attends [Change Control Board](#) meetings when CAP changes occur.
- Submits package with closure request to NNSA/SSO.
- Notifies finding CAP owner of corrective action/milestone closures.
- Retains and maintains electronic copies of documented evidence submitted. (Original hard copies are kept within departments.)

ES&H Application Manager

- Manages the ES&H & Emergency Management segment of the Corporate CATS database.
- Inputs [findings](#), [observations](#), noteworthy practices, and [opportunities for improvement](#) into the Corporate CATS database.
- Provides reports on opened/closed findings to management.

*Information Management Team Lead Writer

- Receives notification by the CAP Owner of CAPs involving probable changes to the *ES&H Manual* and Supplements.
- Communicates the publication requirements for such changes (including review periods and publication process times) to the Finding CAP Owner.
- Assigns Technical Writer(s) to *ES&H Manual* documents that respond to CAPs.

*CORRECTIVE ACTION MANAGEMENT PROGRAM

*Receipt of ES&H Findings or Observations/Opportunities for Improvement (OFI)

The [CAMP Project Lead](#) is the point of contact (POC) for Sandia National Laboratories organizations receiving or generating ES&H [findings](#), [observations](#), or [OFIs](#), or for NNSA/SSO [audits](#). The following organizations or personnel provide reports, findings, or other information to the CAMP Project Lead:

- ES&H and Emergency Management Center office forwards audit reports to CAMP Project Lead. NNSA/SSO or ES&H, Quality, and Safeguards and Security [Audits Assessments](#) Department contacts CAMP Project Lead directly.
- ES&H Program Managers send copies of audit report to CAMP Project Lead.

- CAMP Project Lead also receives findings/observations and OFIs through the ES&H and Emergency Management Center's Programmatic Self-Assessments, ES&H issues from the ES&H Issues Management Review Committee, Chief Defense Nuclear Safety (CDNS) audits, and other sources.

Upon receipt of a finding, observation, or OFI, an entry is made into the Corporate [CATS](#) by the ES&H Application Manager in the ES&H Assurance, Planning, and BBS Department. A finding owner is identified and the ES&H Application Manager starts the CATS E-mail Notifications. The finding owner receives e-mail notification as the person responsible for ensuring the finding is addressed. The finding owner is now responsible for development of the [CAP](#) and assigns the SME or Team Member(s) for generating corrective actions/[milestones](#) necessary to ensure effective closure of the finding. **The CAP Owner also notifies the Lead Writer of the IMT of those CAPs which involve changes to the *ES&H Manual and Supplements*.** If ownership of finding is rejected, the next level of management assigns the proper finding owner. CAP is forwarded to the CAMP Project Lead who, in turn, forwards it to NNSA/SSO. **Observations are tracked in the ES&H and Emergency Management Center's CATS Database.**

For Observations or Opportunities for Improvement (OFI), the CATS database ES&H Application Manager partially completes the Observation/OFI Disposition Form, and forwards it via e-mail to the appropriate finding owner, who then forwards the completed form to the CAMP Project Lead. Normally, a CAP is not required for observations or OFI. Instead, the Observation/OFI Disposition template shall be developed by the responsible finding owner to document disposition of each observation/OFI. The electronic copy is forwarded to the CAMP Project Lead and the hard copy with signatures is kept within the appropriate department.

Change Control Board (CCB)

The [CCB](#) serves as a mechanism within SNL for finding owners to justify requests for extensions or changes to [OA](#) corrective action due dates. A memo to NNSA/SSO shall be submitted requesting the extension. At a minimum, the CCB shall consist of a Chairman (Director), finding manager owner, and the CAMP Project Leader. CCB shall meet as needed.

For other audits, a CCB is not required; however, extensions or changes to corrective action due dates shall be approved by the appropriate Senior Manager. SF 2001 – CAC, Corrective Action Change Request Form, shall be used to document submittal for the extension request.

Causal Analysis/Risk Ranking Using Graded Methodology Approach

The following links lead to guidance for performing causal analyses and risk rankings.

- [Root Cause/Causal Analysis](#)
- [Model for Applying Risk Management Concepts for Prioritizing Findings/Observations](#)

[Findings](#) shall be color coded to indicate the applicability of a causal analysis process to the findings:

- Red rated findings – Causal analysis is required.
- Pink rated findings – Causal analysis is optional with written concurrence from appropriate Director. Justification forwarded to appropriate auditor.
- White rated findings – Causal analysis is not required but deficiency must be closed during time of [audit](#) (i.e., corrected on the spot).

Evidence Packages (Contents)

As a minimum, the [evidence package](#) should include the following items when requesting closure of corrective action(s).

- A memo requesting closure of corrective action.
 - [OA](#) Corrective Actions – [CAP](#) Owner prepares memo for Director's signature. Memo is addressed to NNSA/SSO Manager.
 - NNSA/SSO Corrective Actions – CAP Owner prepares memo for Responsible Manager's signature. Memo is addressed to NNSA/SSO POC.
 - 12870 Corrective Actions – CAP Owner prepares 12870 forms and submits to 12870 Manager.

- [Corrective Action Plan \(CAP\)](#) with the causal analysis.



- Any correspondence, e-mails, and memos related to the deliverable in the corrective action plan.
- Any revised documentation or photos to show the physical evidence required to close the corrective action.
- Any other document deemed necessary to close out the corrective action.

Evidence Packages (Requirements)

Ensure these items are considered when submitting an [evidence package](#).

- Ensure the deliverable of the corrective action is being addressed.
- Ensure that all evidence is included in the package, with appropriate signatures and attachments.
- Review programmatic requirements to ensure compliance.
- Coordinate evidence packages to get “buy-in” before due date to avoid an unacceptable package.



Verification Assessment of Corrective Action/Milestones

[Verification](#) Assessment is performed by the Responsible Manager to ensure compliance with the corrective action requirements. It is an internal review to determine that all corrective actions/[milestones](#) of a [CAP](#) are completed. The Responsible Manager shall:

- Review the evidence of completion for each corrective action and request closure.
- Determine if [evidence package](#) is complete.



Correct Action Plan (CAP) Checklist

This checklist is for use by the [CAP](#) owner to ensure CAP completeness before

implementation. As appropriate, the checklist shall include review steps for the following items;

- Causal statement(s) and causal code(s).
- Corrective actions/[milestones](#) (with expected completion dates — ECDs) addressing the causal statement(s).
- [OFI\(s\)](#) applicable to the [finding](#).
- Corrective actions/milestones that correct any clear variance from requirements.
- Corrective actions/milestones that prevent recurrence of finding.
- A single point of contact responsible for CAP effectiveness.
- Descriptions of the corrective actions/milestones.
- The “deliverable” that will signify the action is completed.
- A mechanism for verifying action completion and ensuring that action will prevent recurrence.
- Use CAP template in Attachment 1 in the development of the CAP.

OA CAP and Corrective Actions/Milestones Requirements

An [OA](#) (DOE HQ) [CAP](#) requires the following actions or responses:

- Emergency Management — Provide interim CAP to DOE/HQ within 30 days from date of final [audit](#) report and final CAP within 60 days.
- ES&H — Provide DOE/HQ with final CAP within 60 days of final report.
- CAP includes a causal analysis, causal codes, and corrective actions/[milestones](#) linking to the analysis of the [finding](#). Use CAP template in Attachment 1.
- CAP is submitted to the [CAMP Project Lead](#).

- CAP is not final until it has been approved by NNSA/SSO. (Implementation begins after NNSA/SSO approval.)
- CAP is not considered closed until:
 1. All corrective actions/milestones are completed.
 2. A [verification of completion of Corrective Actions](#) has been conducted to determine whether completed corrective actions/milestones have effectively resolved and prevented recurrence of the finding. Verification for effectiveness is the last corrective action, to be completed within 90 days of the previous corrective action. If more time is needed, approval for such an extension must be provided by the appropriate Director.
 3. Validation for closure is conducted by NNSA/SSO six months after completion of last corrective action.
 - Corporate [CATS](#) is the database used to track CAP until closure.
 - A [CCB](#) meeting is required for any changes made to the CAP. Written notification of any changes to approved CAP is sent to NNSA/SSO for approval.
 - During development of CAP, interaction with NNSA/SSO is encouraged.
 - Corrective actions/milestones must be verified (memo) as completed by Senior Manager.
 - Submit documented evidence for corrective actions/milestones to CAMP Project Lead.
 - Documented evidence for corrective actions/milestones must meet the “deliverable” expectation and be accepted as evidence for closure.
 - Appropriate VP and finding owner attends Headquarters teleconference, if required, to discuss late OA corrective actions/milestones.

NNSA/SSO CAP and Corrective Actions Requirements

A Sandia Site Office (DOE NNSA/SSO) [CAP](#) requires the following actions or

responses:

- CAP is submitted to NNSA/SSO within 30 days from date of NNSA/SSO memo.
- CAP is submitted to the [CAMP Project Lead](#).
- CAP is not final until NNSA/SSO has approved the plan.
- CAP is not considered closed until all actions are completed.
- CAP changes require approval by the Responsible Manager, who, in turn, submits memo to NNSA/SSO.
- CAP includes [verification of completion of Corrective Actions](#) as the last corrective action to be completed within 90 days. If more time is needed, approval is required by the Responsible Manager.
- During CAP development, interaction with NNSA/SSO is encouraged.
- Submit copies of evidence for completed corrective action/[milestones](#) to CAMP Project Lead.

ES&H, Quality, and Safeguards & Security **Audits** Department CAP & Corrective Actions Requirement

The following Website outlines the requirements for a [CAP](#) responding to an [assessment](#) from ES&H, Quality, and Safeguards and Security **Audits Department**.

- [Corrective Action Plans and Closure Requests](#)

ES&H and Emergency Management Center Programmatic Self-Assessments CAP & Corrective Actions Requirement

The following Web site outlines the requirements for conducting a Programmatic [Self-Assessment](#) and responding to Self-Assessment [findings](#) with a [CAP](#):

- [AOP 04-04, ES&H & Emergency Management Functional Area Self-Assessment Process](#)

Line Self-Assessments CAP & Corrective Actions Requirements

Changes to the *ES&H Manual Section 22A*, "ES&H Line Self-Assessment (SA) Activities" – are presently being developed in response to a 2005 [OA Finding](#). A link will be established and placed in this section as soon as Chapter 22A is completed.

Occurrence Reporting CAP & Corrective Actions Requirement

The following Web site outlines the requirements for writing a [CAP](#) responding to an occurrence report:

- [Guidelines to Writing Effective Corrective Actions](#)

Price Anderson (PAAA) CAP & Corrective Actions Requirement

The following Web site outlines the requirements for responding to PAAA issues:

- [AOP 06-00-01](#)

Injury/Illness CAP & Corrective Actions Requirement

An Administrative Operating Procedure (AOP) detailing how the Injury and Illness program will be monitored, and how incidents are documented, tracked, and closed is presently being developed in response to a 2005 [OA Finding](#). A link will be developed and placed in this section as soon as the AOP is completed.

Issues Management CAP & Corrective Actions Requirement

The following Web site outlines the requirements for responding to ES&H issues:

- [ES&H Issues Management System](#)



REFERENCES

Requirements Source Documents

[DOE O 226.1](#), *Implementation of DOE Oversight Policy*.

[DOE O 414.1B](#), *Quality Assurance*.

[DOE O 420.2B](#), *Independent Oversight & Performance Assurance Program*.

[CPR001.3.11](#), *Corporate Corrective Action Process*.

NNSA/SSO Procedure for Implementing the DOE Corrective Action Tracking System.



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