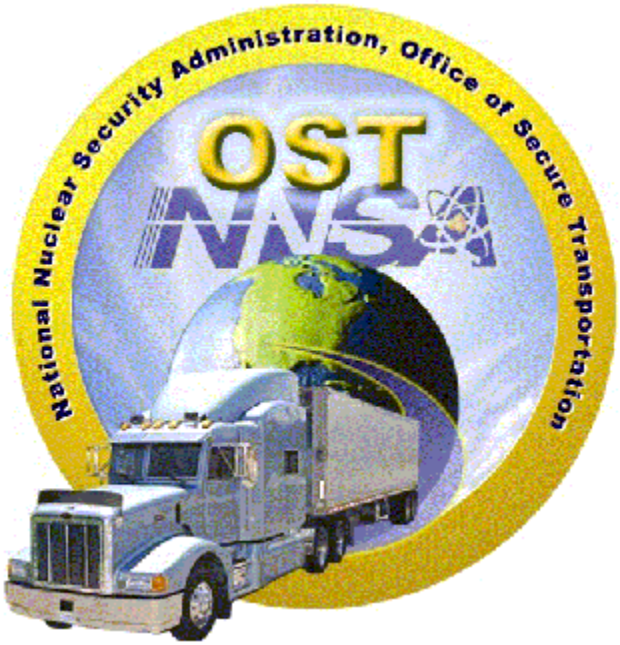
Office of Secure Transportation
Worker Protection Management Program



February 2005

U.S. Department of Energy
National Nuclear Security Administration
Office of Secure Transportation

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U.S. Department of Energy
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INTRODUCTION

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees, establishes*:

- The framework for an effective Worker Protection Management Program that will reduce or prevent accidental losses, injuries, and illnesses by providing workers with a safe and healthful workplace. The Worker Protection Management Program integrates occupational safety, industrial hygiene, occupational medical, fire protection firearms safety, explosives safety, motor vehicle safety, pressure vessel safety, and other functions addressed, in standards required by the Order.
- A comprehensive Worker Protection Management Program that ensures that DOE and its contractor employees are afforded a level of safety and health on the job that is at least equal to that provided to private-sector employees under the *Occupational Safety and Health Act of 1970*. The order outlines a baseline program that can be used as the foundation for the type of proactive Worker Protection Management Program that the best employers in private industry have established in their workplaces.

This document implements DOE O 440.1A and establishes the safety and health program requirements for the Office of Secure Transportation (DOE/OST). This document, along with the implementing policies, plans, programs, and procedures, constitutes the Worker Protection Management Program for DOE/OST.

APPLICABILITY

The requirements of this program apply to DOE/OST federal employees at all locations. Contractor employees are required to follow their own Worker Protection Program as established by their company.

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1.0 MANAGING THE WORKER PROTECTION MANAGEMENT PROGRAM

1.1 Office Manager's Policy

The mission of the Office of Secure Transportation (OST) poses challenges and hazards that are not common to other DOE organizations. This organization is committed to accomplishing our mission successfully while at the same time providing a safe and healthful workplace for all our employees. We will accomplish this by implementing an aggressive and comprehensive Worker Protection Management Program. We regard employee protection as a top priority and are committed to developing, implementing, and improving safety and health practices that will afford optimal protection to people and that will enable us to continually improve the quality of our performance

We expect managers, division directors, section chiefs, and all other employees to be aware of the hazards associated with the work environment and to take steps to ensure that these hazards do not cause injuries or illnesses to people or damage to property, equipment, or the environment (see Annex 1 and annex 2). We must all take an active role in identifying unsafe and unhealthful working conditions or practices and in reporting them to the level of management that can take proper corrective actions.

Being safe and protecting our resources from accidental loss are not things we do in addition to getting the job done; this is how we get the job done.

1.2 Goals

The goals of the DOE/OST Worker Protection Management Program are to:

- Comply with the requirements of the Occupational Health and Safety Act of 1970.
- Implement the requirements in applicable DOE orders.
- Comply with 29 CFR 1960, Basic Program Elements for Federal Employees.
- Provide a safe and healthful workplace for federal and contractor employees.
- Prevent on-the-job injuries and illnesses.
- Prevent the loss and damage to property and equipment due to accidents.

1.3 Objectives

The objectives of the Worker Protection Management Program are:

- Preventing deaths or serious injuries as a result of our operations and training activities.
- Preventing permanent illnesses due to on-the-job exposures.
- Continue to reduce total injury/illness rate.

1.4 Budget

To meet the challenge of implementing the Worker Protection Management Program, it is imperative that managers request adequate funding for the safe operation of facilities and equipment and plan for the effective use of people and other resources. Adequate funding for safety training and equipment should be included in all department budgets.

1.5 Worker Protection Staff Organization

The OST Safety, Security, and Emergency Management Division (SSEMD)/Environment Safety & Health Branch (ESHB) provides support to the organization in the areas of industrial/occupational safety, radiation protection, transportation safety, firearms safety; environmental protection, and health programs. Members of the Branch serve as advisors to the OST Safety Committee and provide technical assistance to Site Safety Advisors (SSA) across the organization. Each Command, Aviation Branch, and TSTS SSA has an assigned ESHB point-of-contact responsible for providing hands-on technical support, as needed. Additional support is available from DOE and Sandia National Laboratories for explosives safety, industrial hygiene, occupational safety, and radiation protection.

Site Safety Advisors form the nucleus of the OST Safety Committee (SC). In addition, the OST/SC consists of members from all OST federal and contractor organizations. The OST/SC is chartered to provide a forum in which those involved in OST safety related activities can meet to provide continuing review, interpretation, and revision of the OST Safety Program. The objective of the OST/SC is to improve utilization of OST safety resources through a formal coordination and communication process. OST shall ensure that all employees' assigned responsibilities for safety have been adequately trained to carry out their assigned duties.

1.6 Accountability

DOE O 440.1A requires that DOE elements assign worker protection responsibilities, evaluate personnel performance, and hold personnel accountable for worker protection performance.

Within DOE/OST, managers must clearly communicate roles, responsibilities, and authorities and insist on accountability of workers at all levels. Managers and supervisors must carry out their own responsibilities and expect employees to follow safe and healthful work practices.

Managers are accountable for the overall Worker Protection Management Program, including training, planning, and allocating resources for their areas of responsibility. Supervisors are accountable for ensuring that worker protection plans, programs, and procedures, including hazard identification and abatement activities, are implemented on a day-to-day basis.

Employees are accountable for following established procedures, using safe work practices, using required protective equipment, reporting hazards and unsafe conditions to their supervisor or manager, and for reporting accidents, injuries, and job-related illnesses.

Contractor employees are accountable for following their own Worker Protection Program as established by their company.

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2.0 RIGHTS AND RESPONSIBILITIES

2.1 Manager Responsibilities

Managers have the responsibility to:

- Provide to their employees a place of employment that is free from recognized hazards that are causing or are likely to cause death or serious physical harm.
- Implement the requirements of this program within their areas of responsibility through worker protection policies, plans, or procedures.
- Ensure that their employees receive the training necessary to perform their assigned tasks without endangering themselves or others.
- Assign worker protection responsibilities, and train employees in those responsibilities.
- Evaluate personnel performance, and hold employees accountable for their performance.
- Implement a proactive process to identify workplace hazards, include frequent walk-through evaluations, evaluate the risks associated with workplace hazards, and take appropriate corrective or abatement action.
- Encourage their employees to become involved in the identification and control of hazards.
- Implement a process to allow workers, to stop work when they discover employee exposures to imminent danger conditions or other serious hazards. The process shall ensure that stop work authority is exercised in a justifiable and responsible manner.
- Ensure that worker exposures to chemical, physical, biological, radiological, or ergonomic hazards are assessed through appropriate analysis and monitoring. When necessary, use the services of trained safety and health professionals to accomplish this monitoring.
- Ensure that workers have access to the information that is required to perform their work safely, including MSDS's and other data on hazardous materials and personal protective equipment.
- Inform workers of their rights and responsibilities by means appropriate to their work environment, including posting the DOE Occupational Safety and Health for the DOE Employees Poster in the workplace where it is accessible to all workers.

2.2 Employee Responsibilities

Employees have the responsibilities to:

- Comply with applicable occupational safety and health standards and worker protection requirements in which they have been trained. These requirements are contained in the policies, plans, and procedures applicable to their jobs.
- Use safety equipment, personal protective equipment, and other protective equipment provided.
- Report to their supervisor or manager any observed unsafe or unhealthful conditions or practices.
- Immediately report on-the-job injuries and illnesses to their supervisor or manager.

2.3 Employee Rights

Employees have the right, without fear of, reprisal to:

- Participate in the activities provided for in this Program on official paid time.
- Accompany worker protection personnel during workplace inspections.
- Express concerns and report unsafe or unhealthful conditions.
- Decline to perform any assigned task because of a reasonable belief that, under normal circumstances, the task poses an imminent risk of death or serious bodily harm, coupled with a reasonable belief that there is insufficient time to seek effective abatement action through normal hazard reporting and abatement procedures.
- Have access to the worker protection publications, standards, and procedures applicable to the workplace.
- Observe monitoring or measuring of hazardous agents and access to the results of exposure monitoring.
- Be notified when monitoring results indicate they were overexposed to hazardous materials.
- Receive results of workplace inspections and accident investigations upon request.

2.4 Hazard/Concern Reporting Program

2.4.1 *Purpose*

The Office of Secure Transportation (OST) Hazard/Concern Reporting Program, defined in OST Policy 1.05, is a formal program available to both OST federal and contractor employees to

identify any hazards or concerns to management's attention. These hazards/concerns can involve safety, security, or operational issues.

Subsection 2.4.3 of this chapter contains the OST Hazard/Concern Report Form with instructions for its completion. This form is recommended for submitting hazard/concern reports so as to ensure all pertinent information is included.

2.4.1.1 Scope

All federal employees are to comply with these procedures. OST management will ensure that processes are in place to support compliance with provisions of these guidelines.

2.4.2 *Instructions*

The instructions listed below should be followed when completing the OST Hazard/Concern Report Form.

- Routing should include the first- and second-level supervisor(s), then the Manager, OST. If resolution is reached while the form is being routed, it should be so noted, but it must reach the Manager, OST, within 10 working days of submission whether or not it is resolved. A copy of the completed report form shall be forwarded to the ES&H Branch for tracking.
- If the hazard/concern can be resolved at the first or second level supervisor level, the supervisor will be deemed the investigator. If it is not resolved within 10 days of submission, an investigator will be assigned when the report is received by the Manager's Office.
- **ADDRESS:** Submissions must be addressed to the Manager, OST, but should be routed through your first- and second-level supervisor(s). Be sure to include the date you are submitting the report. The **FROM** entry block is optional, and employees choosing to remain anonymous may do so. If you choose to remain anonymous, you may send this form to the Manager's Office (bypassing the division level), and your report will be addressed in the *OST News.* By identifying yourself, however, the investigator can clarify any questions that may arise. If you are reporting a hazard you noticed in the past, include all relevant dates in your description.
- **DESCRIPTION OF HAZARD OR CONCERN:** Provide as much detail as possible.
  - **Part A** prompts you to describe your hazard or concern; be sure you answer the questions **WHO, WHAT, WHEN, WHERE, WHY, and HOW.**
  - **Part B** asks for data concerning particulars such as tools, materials, equipment, procedures, or facilities involved. When discussing tools or vehicles, include data items such as the type, model numbers, manufacturer, etc. When discussing material, facilities, a procedure, or a health hazard, describe it in as much detail as possible.

- **RECOMMENDATIONS:** This block provides the originator an opportunity to recommend a solution(s) and indicate whether the corrective actions should be implemented as a routine or a priority action. The goal is to act on all hazard/concern reports within 30 days. However, in some instances corrective actions cannot be completed within the 30-day window. When a determination has been made concerning the events submitted on the form, and corrective actions are believed to require some time before they can be implemented, the originator of the hazard/concern report will be notified of the corrective action time-table. Every effort will be undertaken to address and implement priority corrective measures in 5 working days or less. Recommendations are not mandatory, but are encouraged and welcomed.
- **SUPERVISORS REMARKS/ACTIONS:** Supervisors are encouraged to resolve problems and incorporate suggestions for improvement whenever possible. When hazards pose a serious threat to life or health, supervisors are required to take immediate action to mitigate or eliminate problems. When such actions are undertaken, provide appropriate remarks in this section and forward to the Manager, OST.
- The reverse side of the form is to be completed by the Manager, OST, or designees.
- **INVESTIGATION SUMMARY:** The investigator uses this block to summarize the results of the investigation. While the investigation itself may require a lengthy write-up, the investigator should list the main points in this block. If additional space is required, supplemental sheets may be attached as necessary.
- **RECOMMENDATIONS:** The investigator uses this block to forward recommendations to the Manager, OST. The Manager, OST, will then forward the entire report to the branch responsible for the hazard/concern in question for resolution.
- **ACTIONS TAKEN:** These blocks are used by the responsible Office Manager to describe actions taken and to provide the Manager, OST, space to comment or clarify. The report will be closed out only after the Manager, OST, signs off on the resolution.
- **DATES AND SIGNATURES:** This section contains space for recording and acknowledging duty assignments, dates of assignment and completion, and whether the submitting individual has been apprised of the final results.

All concern/hazard reports that are of general interest will be addressed in the *OST News*. No information regarding the person who filed the report will be revealed.

OFFICE OF SECURE TRANSPORTATION

(OST)
HAZARD/CONCERN REPORT

Routine _____ **Priority** _____ **Report Number:** _____ Page 1 of 2

(Provided By AB/SEQ)

To:

Manager, OST **From:** _____

Description of Hazard or Concern **Submission Date:**

A. Summarize using WHO, WHAT, WHEN, WHERE, WHY, and HOW.

_____

_____

_____

_____ (Additional pages may be used if necessary.)

B. List tools, materials, equipment, procedures, facilities involved, etc.

_____

_____

_____

_____ (Additional pages may be used if necessary.)

Recommendations (Optional) **Routine** _____ **Priority** _____

_____

_____

_____

_____ (Additional pages may be used if necessary.)

Supervisor's Remarks/Actions

_____

_____

_____

To be completed by Manager, OST, or Assigned Designee	Page 2 of 2
Investigation Summary	
Recommendations	
Actions Taken	
A. Name of Office Manager and Responsible Division	
B. Manager, OST	

Date Received	Duty Title	Designee Printed Name	Signature	Date Completed
	(Person Making Report)			
	First Level Supervisor			
	Second Level Supervisor			
	Office Manager			
	Manager, OST			

Reporting Employee Notified of Results? YES NO (Circle one)

Signature of Person Making Notification:

3.0 HAZARD IDENTIFICATION, EVALUATION, AND CONTROL

OST personnel safety is of paramount importance in all OST activities and operations. These include OST management, support staff and contractors, Federal Agents, training activities, aviation operations, over-the-road transportation operations, and support activities and operations.

In order to provide a safe work environment, OST is committed to managing the various risks encountered by its personnel. Risk management, in this context, does not mean risk elimination – many aspects of the OST mission necessarily involve risks that cannot be avoided. OST management accepts residual risk once all the hazards have been evaluated and controls implemented.

Risks are a function of accident likelihoods and consequences. Risk management is the allocation and application of resources to lower accident likelihoods and/or consequences to qualitative or quantitative levels deemed acceptable by the OST NA-15 Assistant Deputy Administrator (ADA). As the designated Approval Authority and Authorizing Official for OST operations, the ADA is the only position authorized to accept OST operational risks on behalf of NNSA.

In order to determine or assess operational risks, a program of work description, hazard identification, hazard evaluation, and hazard control is implemented.

3.1 Hazard Identification

In general terms, hazards are sources of energy, that if uncontrollably released can lead to or cause injury or illness to an employee or damage to a facility or equipment. Hazards can be identified through self-assessments, inspections, reports on unsafe conditions, accidents and accident investigations, formal hazard analysis, reviews of designs for new equipment or facilities, and upgrades to existing facilities. OST uses the Concept to Capability policy (OST Policy 1.03) as another method to identify hazards. As much as practical, hazard identification should be incorporated into normal and routine processes such as design reviews, review of purchase orders, inspections of facilities and equipment, equipment modifications, and development or review of procedures. Assistance can be obtained from professional safety and health staff. Workers, however, are the individuals who are most familiar with the work environment and are in the best position to identify hazards.

3.2 Hazard Analyses

Initial hazard analysis can be a formal or informal process, depending on the situation and conditions involved. Qualitative hazard analysis techniques, suited for a majority of OST activities, include Checklist, What-If, and Hazard and Operability (HAZOP) analysis, with each technique being more formal than the one before. Each technique has its advantages and disadvantages. While the Checklist-type of analysis is simple, informal, and may involve only a single individual, it is not an acceptable method for identifying unknown or hidden hazards or for prioritizing which hazards should be prevented or abated. The formality of the hazard analysis process should depend on both the complexity of the process being analyzed and the potential consequences of accidents involving identified hazards.

A formal process should be employed to review design specifications and drawings for new facilities and major pieces of equipment, and for new procedure plans or significant changes to existing procedures. Formal methods and assistance for conducting hazard analyses should be obtained from professional safety and health staff.

3.3 Hazard Abatement

Hazards identified during the design phase for facilities or equipment, or during the development of new procedures, should be eliminated or controlled through design or procedure changes. In general, the earlier in the life cycle of a system or process that hazards are identified, the easier and less expensive the corrective actions or abatement actions will be. The implemented controls should be commensurate with the risk level associated with the hazard. For example, hazards that pose a serious threat to employee health or safety should be completely eliminated or be effectively controlled.

For existing hazards, abatement actions should be prioritized according to the level of risk to employees as documented in a formal hazard analysis. In the event of **an imminent danger situation**, immediate action should be taken to either correct the imminent danger situation, or employees must be removed from exposure until the condition is abated. For other hazards, it is essential that workers be protected from exposures to the hazard awaiting final abatement action. Methods such as administrative controls, work practice modifications, or personal protective equipment can be used to provide an acceptable level of risk until final abatement action is completed.

3.4 Risk Assessment

The relative level of risk must be assessed for each identified hazard to ensure that available resources are used effectively. Relative risk is assigned based on the likelihood of worker exposure and the potential consequences of such an exposure. Safety and health professionals can assist in conducting formal hazard analyses and risk assessments for significant accident consequences. Although it is important to assign risk and prioritize abatement actions, these activities should not delay a quick abatement action if one is possible. If a hazard can be fixed immediately, do so.

Hazards associated with OST over-the-road and aviation transportation activities have been formally evaluated and are identified in such documents as Hazard Analysis Report (HAR), Transportation Safety Analysis Report (TSAR), the Defense Programs Transportation Risk Assessment (DPTRA), and the OST Technical Safety Requirements. The ES&H staff in the Office of Support, Environment Safety and Health Branch can help identify and evaluate other hazards.

The priority of abatement actions should be based on the assigned risk level so that the more serious risks are abated first. However, other factors sometimes affect the priority for abating hazards. Some of these are regulatory compliance, available resources, and organizational mission. In many cases, lower level hazards are corrected before higher-level hazards are addressed.

3.5 Control Hierarchy

DOE O 440.1A requires that the methods selected to control hazards be based on the following hierarchy:

1. Engineering controls.
2. Work practice and administrative controls.
3. Use of personal protective equipment.

Subsections 3.5.1 through 3.5.3 discuss these hazard control methods.

3.5.1 *Engineering Controls*

Principal engineering controls include:

- Eliminating the hazard through a design change, change in mission or requirements, or a change in the process that will eliminate the hazard completely.
- Substituting a less hazardous substance or process.
- Enclosing the hazard.
- Locating the hazardous operation or equipment in remote or unoccupied areas.
- Establishing physical barriers and guards.
- Using local and general exhaust ventilation.

3.5.2 *Work Practice and Administrative Controls*

Work practice and administrative controls include:

- Written operating procedures, safe work practices, and work permits.
- Conduct Job Task Analysis of all job positions.
- Exposure time limitations.
- Limits on the use of hazardous materials and monitoring exposures.
- Health and safety plans.
- Altered work schedules to reduce exposures.
- Training employees in methods of reducing exposures.

3.5.3 *Personal Protective Equipment (PPE)*

When engineering and/or administrative controls have been considered and implemented and are not sufficient to fully protect workers from recognized hazards, personal protective equipment (PPE) may be used to supplement other controls. PPE is acceptable as a control method:

- To supplement engineering, work practice, and administrative controls when such controls are not feasible or do not adequately reduce the hazard.
- As an interim measure while engineering controls can be developed and implemented.
- During emergencies when engineering controls may not be feasible.
- During maintenance and other non-routine activities where other controls are not feasible.

The use of PPE can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication (see annex 4). In some situations, protective controls, such as time limits on the use of PPE, need to be established. The two objectives of the use of PPE are to protect the wearer of exposure to hazards and to prevent injury to the wearer from incorrect use or malfunction of the PPE. A comprehensive work practice should be developed for the use of PPE to include proper selection of PPE,

training for users, medical surveillance, and maintenance and decontamination of PPE. Development of these practices should involve representatives of the affected safety disciplines such as industrial hygiene, health physics, fire protection, or industrial safety.

For a complete summary of PPE refer to 29 CFR 1910.132, Personal Protective Equipment.

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4.0 INVESTIGATING AND REPORTING ACCIDENTS, INJURIES/ILLNESSES, EXPOSURES, AND OCCURRENCES

4.1 DOE Requirements

Requirements to be added at a later day.

4.2 Reporting Accidents, Injuries/Illnesses, and Vehicle Accidents

Accurate reporting of undesirable events requires the prompt reporting to supervisors, managers, and the office responsible for submitting written reports. Subsections 4.2.1 through 4.4 identify reporting responsibilities.

4.2.1 *Employee Responsibilities*

Employees are usually the first persons to become aware that an accident has occurred or that they have been injured or become ill as a result of an on-the-job exposure.

When they become aware of a vehicle accident or damage to property as a result of DOE operations, employees shall notify their supervisor or manager promptly. For serious accidents involving fatalities, serious injuries or major damage to a facility, employees must notify their supervisor or manager immediately. The employee should note the specifics of the accident such as date, time, description of vehicle or property involved, persons involved, and description of damage and report this to the supervisor.

If an on-the-job injury occurs, the employee reports it to the job supervisor and is given Form CA-1, Federal Employee's Notice of Traumatic Injury Report and Claim for Continuation of Pay/Compensation. The employee completes the "Employee" portion of the form, signs it, and returns it to the supervisor. If the employee is unable to complete the form, the supervisor or someone acting on the employee's behalf may complete it. If medical treatment is required, the employee is given Form CA-16, Authorization for Examination and/or Treatment, to seek medical treatment (see Table 1).

An employee who becomes ill from a job-related exposure must report to the supervisor. The employee is given Form CA-2, Notice of Occupational Illness/Disease and Claim for Compensation, to document the illness and Form CA-16 to receive medical treatment. The employee completes the "Employee" portion of Form CA-2 and returns it to the supervisor. For all motor vehicle accidents, complete Standard Form 91, Motor Vehicle Accident Report and return to supervisor.

Table 1 Forms Used by OST

Title:	DFEC CA-1, Federal Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation
Form Description:	DFEC CA-1, Federal Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation: This form is used by a federal employee to provide notice of traumatic injury and to claim continuation of pay (compensation). The form must be filed with one's employing agency.
Title:	DFEC CA-2, Notice of Occupational Disease and Claim for Compensation
Form Description:	DFEC CA-2, Notice of Occupational Disease and Claim for Compensation: This form is used by a federal employee to provide notice of occupational disease and to claim compensation. This form must be filed with one's employing agency.
Title:	DFEC CA-16, Authorization for Examination and/or Treatment
Form Description:	DFEC CA-16, Authorization for Examination and/or Treatment: This form is completed by an authorized supervisor and given to the employee.
Title:	DFEC F 5484.3, Individual Accident/Incident Report
Form Description:	DFEC F 5484.3: Individual Accident/Incident Report: This form is used by a federal employee to provide notice of an accident or incident. This form must be filed with one's employing agency.
Title:	Standard Form 91, Motor Vehicle Accident Report
Form Description:	Standard Form 91, Motor Vehicle Accident Report: This form is used by a federal employee to provide notice of an accident or incident. This form must be filed with one's employing agency.

4.2.2 *Supervisor and Manager Responsibilities*

For vehicle and property damage accidents, supervisors conduct an investigation and report the results to the Environment, Safety, and Health (ES&H) Branch for further investigation, if necessary. If needed, the supervisor may request assistance from a safety professional in conducting the investigation. For property and vehicle damage accidents, the supervisor shall complete DOE Form 5484.3, Individual Accident/Incident Report. In the event that further investigation is warranted, preservation of the accident scene may be necessary. Preserving the accident scene may be accomplished through:

- Roping off the area, placing barricades or guards, and otherwise limiting access to the scene.
- Identifying persons involved and/or witnesses and taking initial statements.

- Taking photographs or making diagrams of the accident.
- Taking equipment out of use (if not essential to other operations).
- Making copies of equipment and personnel logs and other pertinent records.
- Noting time, location, ambient conditions, and property involved.
- Assigning ownership or custody of evidence.

For injuries and illnesses, the supervisor will provide the employee with Form CA-1 or Form CA-2 to complete. If medical treatment is necessary, the supervisor will also give the employee Form CA-16. The supervisor shall conduct an investigation of the event and complete DOE Form 5484.3. This report must include information about lost workdays, factors causing or contributing to the incident, medical treatment, and corrective actions taken. Prior to transmittal to the Support Branch, the supervisor must have the Exercise Physiologist review the completed DOE Form 5484.3. The supervisor will then provide a copy of the completed Form CA-1 or CA-2, and DOE Form 5484.3 to the Program Analyst at each section.

4.2.3 *Resources and Business Management Division Responsibilities*

The Resources and Business Management Division (RBMD) reviews DOE Form 5484.3 data and any additional medical or other information regarding the reported incident, logs the information into the database, and maintains the PC Compliance database. The information is used to track and trend all OST injuries and costs, generate the required OSHA 300 Log, coordinate with the OST ES&H Branch, and provide the injury information for each Courier section.

The RBMD provides the OSHA Form 300 Log annually to each Agent operation. The OST form 300 Log shall be compiled no later than 45 calendar days after the close of the fiscal year. The Log shall be posted for a minimum of 30 consecutive days in a conspicuous location (i.e., bulletin boards).

The RBMD staff compiles all new submittals of DOE Form 5484.3 at the end of each calendar quarter, along with the tabulation of work-hours, vehicle usage, and property valuation, and provides these through the ES&H Branch to Scientech, Inc., Idaho.

4.3 Reporting Ionizing Radiation Exposures

Sandia National Laboratories (SNL) maintains records of radiation exposure to OST employees. SNL provides annual reports of exposure to OST employees who are monitored by the Radiation Protection Dosimetry Program. Upon request, the employee shall receive a current radiation dose record. SNL also submits the annual radiation dose summary report for OST

monitored employees and visitors. Annual summary reports are provided to the OST ES&H Branch in May of each year for distribution to OST personnel. (See **Annex 1**)

4.4 Reporting Occurrences

DOE M 231.1-1A Chg 1, *Environment, Safety and Health Reporting,* requires the reporting of occurrences that have potential safety, environmental, health, or operational significance. Designated facility managers report occurrences to DOE. The designated facility manager for DOE/OST is the Director of the Safety, Security, and Emergency Management Division (SSEMD).

Employees who become aware of an incident that might be considered a DOE Occurrence shall report the incident to their supervisor who in turn will report to the designated facility manager. The facility manager shall generate a report and provide it to SSEMD. In accordance with the requirements and instructions in DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, a report will then be filed.

4.5 Analyzing and Using Accident and Injury/Illness Data

The RBMD and SSEMD support a Process Management Team to review employee injuries and illnesses, as well as the costs and lost workdays associated with injuries (see **Annex 1**).

The SSEMD has primary responsibility for the Accident Review Committee, defined in OST policy (see ES&H Policy 7.01), which is formally organized and chartered to assist the Safe Driving Awards Program by reviewing all pertinent information regarding vehicle accidents.

5.0 TRAINING

5.1 DOE Requirements

DOE requires that each DOE element provide appropriate occupational safety and health training for managers, supervisors, health and safety specialists, and all other employees. This training must be sufficient to allow each employee to perform work safely and in a healthful manner while complying with requirements and standards.

5.2 Manager and Supervisor Responsibilities

Managers and supervisors must determine the occupational safety and health training requirements for their employees. This is accomplished through several methods including a review of:

- Job descriptions.
- Hazard analyses of job tasks.
- Applicable occupational safety and health standards.
- Applicable American National Standards Institute (ANSI) standards.
- DOE directives.
- Reports on accidents, injuries/illnesses, and occurrences.
- Reports on worker protection audits, appraisals, and inspections.

Managers may elect to develop a list of training requirements for all their employees or develop a list of training requirements for individuals performing specific tasks per OTS Training/ Curriculum Development SOP. Managers shall identify the training that is required one time or initially, and training that is required on a recurring basis (refresher training). In all cases, however, managers must ensure that each individual receives the required training prior to being exposed to any hazard on the job.

DOE orders and OSHA standards identify the following topics as necessary in employee protection training:

- Training for manager and supervisor responsibilities.
- Specialized training for safety and health professionals.
- Hazards communications for employees exposed to hazardous materials.
- Safe use of lasers.
- Practices for respiratory protection.

- Safety in welding and cutting.
- Electrical safety requirements for employee workplaces.
- Safe use of firearms.
- Safe vehicle operations.
- Control of suspect and counterfeit items.
- Radiation protection.
- Handling explosives.
- Transportation of hazardous material.

The above list does not necessarily include all of the safety and health training that may required for any one employee, nor is it intended to stipulate that all employees must receive all of this training. Managers must review the needs and hazard exposures of each employee and provide to each individual the necessary training to ensure that that individual can work safely.

5.3 Providing Worker Protection Training

Worker protection training is completed through several venues including formal courses, computer-based courses, DOE-provided courses, or on-the-job training. Managers must identify training needs and provide a sufficient budget to complete the training required by their employees.

5.4 Maintaining Records

Managers must maintain a list of the training requirements for each of their employees (including non-Agent staff) and a record of training that has been completed. These records may be maintained in the computerized database, Qualification and Training System (QTS), maintained by the Training and Logistics Division.

6.0 OFFICE SAFETY

6.1 Introduction

Although most serious accidents occur in industrial locations, office environments pose a variety of hazards that can cause injuries and job-related illnesses. The material in this chapter addresses the more common hazards found in offices and administrative areas along with steps that employees can take to prevent injuries.

Managers have the responsibility to provide their employees with safe and healthful work areas. Managers should conduct periodic walk-through inspections to ensure that employee work areas are safe (see annex 3). Employees, however, are more familiar with their workspaces and are in the best position to identify unsafe conditions. Employees must play an active role in identifying hazards and reporting these to their supervisor or manager (See Chapters 3 and 4 respectively).

6.2 Office-Related Illness and Injury

Changes have occurred in the American workplace as a result of the new office technology and automation of office equipment. As with all new technology, these changes bring with it a set of health and safety concerns. In addition to obvious hazards such as slippery floors or an open file drawer, a modern office may also contain hazards such as, poor lighting, noise, poorly designed furniture, and equipment and machines that emit gases and vapors when properly maintained. Even the nature of office work itself has produced a whole host of stress-related symptoms and musculoskeletal strains. For example, long hours at a poorly designed computer workstation can cause pains in the neck and back, shoulders, lower extremities, arms, wrists, hands, eyestrain, and a general feeling of tension and irritability. The leading types of disabling accidents that occur within the office are the result of falls, strains and over exertions, falling objects, striking against objects, and being caught in or between objects.

6.2.1 *Falls*

Falls are the most common office accident, accounting for the greatest number of disabling injuries. The disabling injury rate of falls among office workers is 2 to 2.5 times higher than the rate for non-office employees. A fall occurs when you lose your balance and footing. Once of the most common causes of office falls is tripping over an open desk or file drawer. Bending while seated in an unstable chair and tripping over electrical cords or wires are other common hazards. Office falls are frequently caused by using a chair or stack of boxes in place of a ladder and by slipping on wet floors. Loose carpeting, objects stored in halls or walkways, and

inadequate lighting are other hazards that invite accidental falls. Fortunately, all of these fall hazards are preventable. The following checklist can help stop a fall before it happens.

- Be sure the pathway is clear before you walk.
- Close drawers completely after every use.
- Avoid excessive bending, twisting, and leaning backward while seated.
- Secure electrical cords and wires away from walkways.
- Always use a stepladder when reaching overhead. Chairs should never be used as ladders.
- Clean up spills immediately.
- Pick up objects co-workers may have left on the floor.
- Report loose carpeting or damaged flooring.
- Never carry anything that obscures your vision.
- Wear stable shoes with non-slip soles.
- If you find yourself heading for a fall, remember - roll, don't reach. By letting your body crumple and roll, you are more likely to absorb the impact and momentum of a fall without injury. Reaching an arm or leg out to break your fall may result in a broken limb instead.

6.2.2 *Strains and Overexertion*

Although a typical office job may not involve lifting large or especially heavy objects, it's important to follow the principles of safe lifting. Small, light loads (i.e., stacks of files, boxes of computer paper, books) can wreak havoc on your back, neck, and shoulders if you use your body incorrectly when you lift them. Backs are especially vulnerable; most back injuries result from improper lifting. Before you pick up a carton or load, ask yourself these questions:

- Is this too heavy for me to lift and carry alone?
- How high do I have to lift it?
- How far do I have to carry it?
- Am I trying to impress anyone by lifting this?

If you feel that the lift is beyond your ability, contact your supervisor or ask another employee to assist you.

6.2.2.1 Safe Lifting Steps

1. Assume a balanced stance with feet placed shoulder-width apart. When lifting something from the floor, squat close to the load.
2. Keep your back in its neutral or straight position. Tuck in you chin so your head and neck continue the straight back line.

3. Grip the object with your whole hand, rather than only with your fingers. Draw the object close to you, holding your elbows close to your body to keep the load and your body weight centered.
4. Lift by straightening your legs. Let your leg muscles, not your back muscles, do the work. Tighten your stomach muscles to help support your back. Maintain your neutral back position as you lift.
5. Never twist when lifting. When you must turn with a load, turn your whole body, feet first.
6. Never carry a load that blocks your vision.
7. To set something down, use the same body mechanics designed for lifting.

6.2.2.2 Lifting from a Seated Position

Bending from a seated position and coming back up places tremendous strain on your back. Also, your chair could become unstable and slip out from under you. Instead, stand and move your chair out of the way. Squat and stand whenever you have to retrieve something from the floor.

6.2.2.3 Ergonomic Solutions to Backbreaking Tasks

1. If you are doing a lot of twisting while lifting, try to rearrange the space to avoid this. People who have to twist under a load are more likely to suffer back injury.
2. Rotate tasks so that periods of standing alternate with moving or sitting.
3. Ask for stools or footrests for stationary jobs.
4. Store materials at knee level whenever possible instead of on the floor.
5. Make shelves shallower (12-18") so one does not have to reach forward to lift the object. Break up loads so each weighs less.
6. If your must carry a heavy object some distance, consider storing it closer, request a table to rest it on, or try to use a hand truck or cart to transport it.

6.2.3 *Struck By or Striking Objects*

Striking against objects is another cause of office injuries. Incidents of this type include:

- Bumping into doors, desks, file cabinets, and open drawers.
- Bumping into other people while walking.
- Striking open file drawers while bending down or straightening up.
- Striking against sharp objects such as office machines, spindle files, staples, and pins.
- Pay attention to where you are walking at all times, properly store materials in your work area and never carry objects that prevent you from seeing ahead of you.

Objects striking employees occur as a result of:

- Office supplies sliding from shelves or cabinet tops.
- Overbalanced file cabinets in which two or more drawers were opened at the same time or in which the file drawer was pulled out too far.
- Machines, such as computers or printers that were dropped on feet.
- Doors that were opened suddenly from the other side.

Proper signage, material storage and use of storage devices can avoid these accidents.

6.2.4 *Caught In or Between Objects*

The last category of leading disabling incidents occurs as a result of office workers who get their fingers or articles of clothing caught in or between objects. Office workers may be injured as a result of:

- Fingers caught in a drawer, door, or window.
- Fingers, hair or articles of clothing and jewelry caught in office machines.
- Fingers caught under the knife-edge of a paper cutter.

While working on office equipment, concentrate on what you are doing.

6.2.5 *Material Storage*

Office materials that are improperly stored can lead to objects falling on workers, poor visibility, and create a fire hazard. A good housekeeping program will reduce or eliminate hazards associated with improper storage of materials. Examples of improper storage include - disorderly piling, piling materials too high, and obstructing doors, aisles, fire exits and fire-fighting equipment. The following are good storage practices:

- Boxes, papers, and other materials should not be stored on top of lockers or file cabinets because they can cause landslide problems. Boxes and cartons should all be of uniform size in any pile or stack. Always stack material in such a way that it will not fall over.
- Store heavy objects on lower shelves.
- Try to store materials inside cabinets, files, and lockers.
- Office equipment such as scanners, printers, index files, lights or calculators should not be placed on the edges of a desk, filing cabinet, or table.
- Aisles, corners, and passageways must remain unobstructed. There should be no stacking of materials in these areas.
- Storage areas should be designated and used only for that purpose. Store heavy materials so you do not have to reach across something to retrieve them.

- Fire equipment, extinguishers, fire door exits, and sprinkler heads should remain unobstructed. Materials should be at least 18 inches minimum away from sprinkler heads.
- Flammables and other chemicals should be stored only in approved storage containers
- Only a “one shift supply” of required chemicals may be kept in the office environment

6.3 Workstation Ergonomics

Ergonomics means fitting the workplace to the workers by modifying or redesigning the job, workstation, tool or environment. Workstation design can have a big impact on office workers health and well-being. There are a multitude of discomforts which can result from ergonomically incorrect computer workstation setups. The most common complaints relate to the neck, shoulders, and back. Others concern the arms and hands and occasionally the eyes. For example, poor chairs and/or bad postures can cause lower back strain; or a chair that is too high can cause circulation loss in legs and feet.

Certain common characteristics of VDT jobs have been identified and associated with increased risk of musculoskeletal problems. These include:

- Design of the workstation
- Nature of the task
- Repetitiveness of the job
- Degree of postural constraint
- Work pace
- Work/rest schedules
- Personal attributes of individual workers

The key to comfort is in maintaining the body in a relaxed, neutral position. The ideal work position is to have the arms hanging relaxed from the shoulders. If a keyboard is used, arms should be bent at right angles at the elbow, with the hands held in a straight line with forearms and elbows close to the body. The head should be in lined with the body and slightly forward.

6.3.1 *Arranging Your Workstation to Fit You*

- Adjust the height of the chair’s seat such that the thighs are horizontal while the feet are flat on the floor.
- Adjust the seat pan depth such that your back is supported by the chair backrest while the back of the knee is comfortable relative to the front of the seat.
- Adjust the backrest vertically so that is supports/fits the curvature of your lower back.

- With the arms at your sides and the elbow joint approximately 90 degrees, adjust the height/position of the chair armrests to support the forearms.
- Adjust the height of the keyboard such that the fingers rest on the keyboard home row when the arm is to the side, elbow at 90 degrees, and the wrist straight.
- Place the mouse, trackball, or special keypads, next to the keyboard tray. Keep the wrist in a neutral position with the arm and hand close to the body.
- Adjust the height of the monitor such that the top of the screen is at eye level. If bifocals/trifocals are used, place the monitor at a height that allows easy viewing without tipping the head back.
- Place reference documents on a document holder close to the screen and at the same distance from the eye.
- A footrest may be necessary if the operator cannot rest his/her feet comfortably on the floor.

6.3.2 *Applying Good Work Practices*

The way a task is performed and the workstation environment it is performed it can influence the risk of injury and general work productivity. Good technique can make a job easy and safe to accomplish, for example:

- Adjusting the drapes or blinds
- Moving the monitor away from sources of glare or direct light.
- Tipping the monitor slightly downward
- Using diffusers on overhead lighting
- Placing an anti-glare filter on the screen
- Clean the monitor screen on a regular basis
- Avoid cradling the telephone between the head and shoulder. Hold the phone with your hand; use the speakerphone, or a headset.
- Keep frequently used items like the telephone, reference materials, and pens/pencils within easy reach.
- Position the monitor directly in front of the user.
- Move between different postures regularly
- Apply task lighting as to your needs.
- Use the minimum force necessary to strike the keyboard/ten-key keys.
- Use the minimum force necessary to activate the hole punch and stapler.
- Vary your tasks to avoid a long period of one activity.
- Take mini-breaks to rest the eyes and muscles. A break does not have to be a stop of work duties. However, it should be a different style of physical activity such as changing from keyboarding to using the telephone or filing.

- Neutralize distracting noise by using ear plugs, playing soft music, or turning on a fan.
- Maintain a comfortable workplace temperature by using layers of clothing or a fan.

6.4 Indoor Air Quality and Ventilation

- Indoor air quality (IAQ) is an increasingly important issue in the work environment. The study of indoor air quality and pollutant levels within office environments is a complex problem. The complexity of studying and measuring the quality of office environments arises from various factors including:
- Office building floor plans are frequently changing to accommodate increasingly more employees and reorganization.
- Office buildings frequently undergo building renovations such as installation of new carpet, modular office partitions and free-standing offices, and painting.
- Many of the health symptoms appearing are vague and common both to the office and home environment.
- Guidelines or standards for permissible personal exposure limits to pollutants within office buildings are very limited.

Many times odors are associated with chemical contaminants from inside or outside the office space, or from the building fabric. This is particularly noticeable following building renovation or installation of new carpeting. Out-gassing from such things as paints, adhesives, sealants, office furniture, carpeting, and vinyl wall coverings is the source of a variety of irritant compounds, In most cases, these chemical contaminants can be measured at levels above ambient (normal background) but far below any existing occupational evaluation criteria. Many organizations have conducted hundreds of building studies which indicate that the most likely sources of this problem are - poor ventilation, poor thermal conditions, too high or low humidity, emissions from office machines, copiers and other building contaminants and poor ergonomic layout of workstations.

6.4.1 *Overview of Ventilation Design*

Air enters office buildings or spaces through both mechanical ventilation systems as well as naturally through leaks around windows, doors, etc. Newer, larger buildings which are highly energy efficient due to sealed windows and heavy insulation primarily depend on mechanical ventilation. Older, small, and low occupancy office buildings can be adequately ventilated through natural sources which include air leakage through opened windows and doors, as well as through cracks in the windows and walls, and other openings.

In a modern office building, the heating ventilation and air conditioning system (HVAC) is designed to keep occupants comfortable and healthy by controlling the amount of outside air that is added to the building atmosphere, filtering both incoming and recirculated air to remove particulates and controlling the temperature. The HVAC system includes all heating, cooling, and ventilation equipment serving a building: furnaces or boilers, chillers, cooling towers, air handling units, exhaust fans, ductwork, filters, steam (or heating water) piping. A ventilation system consists of a blower to move the air, ductwork to deliver air to the room, and vents to distribute the air. A good ventilation design will distribute supply air uniformly to each area and especially areas with office machines. An effectively designed area will not have the supply and exhaust vent too close together because fresh air may be removed before it is adequately distributed throughout the area. Exhaust fans are often located a significant distance away from supply vents. A simple way to determine if the ventilation system is running of if a vent is a supply to exhaust is by holding a tissue near the vent. If the tissue moves, the air is being circulated and the direction the tissue is blown will determine the type of vent.

The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) has established a general guideline of 20 cubic feet of outside air per minute/per person for an office environment. This is a sufficient amount of air to dilute building contaminants and maintain a healthy environment. Indoor air quality complaints increase significantly in offices that are not supplied sufficient outside air.

6.4.2 *Environmental Parameters*

A ventilation system should provide for a comfortable environment with respect to humidity and temperature. The overall goal of climate control is to provide an environment that is not too cold, hot, dry or humid, and that is free from drafts and odors. Humidity refers to the amount of moisture in the air and extremes in humidification levels can influence how comfortable you may be. When the air is too humid, it makes people feel uncomfortable (wet, clammy) and can promote mold growth. On the other hand, low humidity conditions (which typically occur in the winter months) dry out the nasal and respiratory passages. Low humidity may be associated with an increased susceptibility to upper respiratory infections. Static electricity problems (affecting hair and clothes, particularly synthetic fibers) are good indicators of an office with low relative humidity.

Excessively high or low temperatures in an office area can also lead to symptoms in building occupants and reduce productivity. High temperatures have been associated with fatigue, lassitude, irritability, headache and decrease in performance, coordination and alertness. A number of factors interact to determine whether people are comfortable with the temperature of the indoor air. The activity level, age, and physiology of each person affect the thermal comfort requirements of that individual. Extreme heat, which is unlikely to be found in an office

environment, can result in heat rash, exhaustion, and fainting. Workers who may be less alert or fatigued from a high temperature environment may be more prone to accidents. Likewise, if the environment is too cold, flexibility, dexterity, and judgment may be impaired and therefore accidents may increase.

The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) has published guidelines for maintaining comfortable and productive work environments. According to ASHRAE, these temperature ranges represent the environmental conditions which 80% of the building occupants consider comfortable. ASHRAE recommends the following temperature and humidity ranges for office work:

Relative Humidity	Winter Temperature Range	Summer Temperature Range
30%	68.5 - 76.0 F	74.0 - 80.0 F
40%	68.5 - 75.5 F	73.5 - 79.5 F
50%	68.5 - 74.5 F	73.0 - 79.0 F
60%	68.0 - 74.0 F	72.5 - 78.0 F

Note: Relative humidity above 50% is not recommended because it can promote mold growth.

6.4.3 *Indoor Air Pollution*

An inadequately ventilated office environment or a poorly designed ventilation system can lead to the build up of a variety of indoor air pollutants. Air pollutants can originate within the building or be drawn in from outdoors. Examples of sources that originate outside a building include: (1) pollen, dust and fungal spores; (2) general vehicle exhaust; (3) odors from dumpsters; and (4) re-entrained exhaust from the building itself or from neighboring buildings. Examples of sources that originate from within the building include: (1) building components and furnishings; (2) smoking; (3) maintenance or remodeling activities (painting, etc.); (4) housekeeping activities; (5) unsanitary conditions (standing water from clogged drains or dry traps) and water damage; and (6) emissions from office equipment or special use areas (print shops, laboratories, or food preparation areas).

6.4.4 *Controls to Prevent Indoor Air Pollution*

The following recommendations and guidelines are useful in preventing indoor air quality problems:

- HVAC systems should receive periodic cleaning and filters should be changed on a regular basis on all ventilation systems.
- The ventilation system should introduce an adequate supply of fresh outside air into the office and capture and vent point air pollutant sources to the outside.
- Office machinery should be operated in well-ventilated areas. Most office machinery does not require local exhaust ventilation in areas that are already provided with 7-10 air changes per hour. Photocopiers should be place away from workers' desks. Workers should vary work tasks to avoid using machines excessively.
- Office equipment should be cleaned/maintained according to the manufacturer's recommendations. Properly maintained equipment will not generate unhealthy levels of pollutants.
- Special attention should be given to special operations that may generate air contaminants (such as painting, pesticide spraying, and heavy cleaning). Provisions for adequate ventilation must be made during these operations or other procedures, such as performing work off-hours or removing employees from the immediate area, utilized.

6.4.5 *Evaluation*

In order to determine if a possible relationship between any adverse health symptoms and indoor air quality exist, an indoor air quality survey should be conducted. This survey should consist of an evaluation of potential sources of pollutants, a measurement program that involves selecting appropriate instrumentation and designing the monitoring effort, and, finally, an interpretation of the data gathered. In many situations, the cause of the inadequate indoor air quality can be recognized and certain mitigation measures suggested and/or implemented. To request an indoor air quality investigation, contact ESHB.

6.4.6 *Lighting*

Lighting is one of the most important factors affecting personal comfort on the job. The best lighting system is one in which the light level is geared to the task, where brightness ratios are controlled (no intensely bright or dark areas in one field of vision) and where ceilings, walls, and floors are carefully chosen to minimize glare. Glare is defined as a harsh, uncomfortable bright light that shines directly in the eyes. Glare may be direct, coming from lights or sunshine, or indirect, coming from a reflected surface.

Different tasks require different levels of lighting. Areas in which intricate work is performed, for example, require greater illumination than warehouses. Lighting needs vary from time to time and person to person as well. One approach is to use adjustable task lighting that can provide needed illumination without increasing general lighting.

Vision problems are one of the leading sources of complaints among office workers. Poor office lighting can cause eyestrain and irritation, fatigue, double vision, watering and reddening of the eyelids, and a decrease in the power of focus and visual acuity. Headaches as well as neck and back pains may occur as a result of workers straining to see small or detailed items. Poor lighting in the workplace is also associated with an increase in accidents. Direct and reflected glare and shadows as well as delayed eye adaptation when moving from bright surroundings into dark ones (or vice versa) may prevent an employee from seeing tripping and other similar hazards. There are a number of measures that can be used to prevent and control poor lighting conditions in the work environment:

- Regular maintenance of the lighting system should be carried out to clean or replace old bulbs and faulty lamp circuits.
- A light-colored matte finish on walls, ceilings, and floors to reduce glare is recommended by the Illuminating Engineering Society.
- Whenever possible, office workers should not face windows, unshielded lamps, or other sources of glare.
- Adjustable shades should be used if workers face a window.
- Diffuse light will help reduce shadows. Indirect lighting and task lighting are recommended, especially when work spaces are separated by dividers.
- Task lamps are very effective in supplementing general office lighting for those who require or prefer additional lighting. Some task lamps permit several light levels.

6.4.7 *Noise*

Noise can be defined very simply as unwanted sound. Office workers are subjected to many noise sources including video display terminals, high-speed printers, telephones, fax machines, and human voices. Noise can produce tension and stress as well as damage to hearing at high noise levels. For noise levels in offices, the most common effects are interference with speech communication, annoyance, and distraction from mental activities. The annoying effect of noise can decrease performance or increase errors in some task situations. If the tasks require a great deal of mental concentration, noise can be detrimental to performance.

Government standards have set limits for exposure to noise to prevent hearing loss in employees. The level of noise one can safely be exposed to is dependent on the intensity of the noise as well as the duration of exposure. In an office setting OSHA noise standards are rarely

approached or exceeded. However, problems could arise in areas with a high concentration of noisy machines, such as high-speed printers or Xerox machines.

When employees are subjected to sound levels exceeding OSHA standards, feasible administrative or engineering controls must be utilized. If such controls fail to reduce sound levels, personal protective equipment must be provided and used to reduce sound levels. For many of the annoying sounds in the office environment, the following measures are useful for reducing the level of noise or its effects:

- Select the quietest equipment if possible. When there is a choice between two or more products, sound levels should be included as a consideration for purchase and use.
- Provide for proper maintenance of equipment, such as lubrication and tightening of loose parts that can cause noise.
- Locate loud equipment in areas where its effects are less detrimental. For example, place impact printers away from areas where people must use the phone.
- Use barrier walls or dividers to isolate noise sources. Use of buffers or acoustically-treated materials can absorb noise that might otherwise travel further. Rubber pads to insulate vibrating equipment can also help to reduce noise.
- Enclose equipment, such as printers, with acoustical covers or housings.
- Schedule noisy tasks at times when it will have less of an effect on the other tasks in the office.

6.5 Office Electrical Safety

Electricity is essential to the operations of a modern automated office as a source of power. Electrical equipment used in an office is potentially hazardous and can cause serious shock and burn injuries if improperly used or maintained.

Electricity travels through electrical conductors, which may be in the form of wires or parts of the human body. Most metals and moist skin offer very little resistance to the flow of electrical current and can easily conduct electricity. Other substances such as dry wood, porcelain, or pottery offer a high resistance and can be used to prevent the flow of electrical current. If a part of the body comes in contact with the electrical circuit, a shock will occur. The electrical current will enter the body at one point and leave at another. The passage of electricity through the body can cause great pain, burns, destruction of tissue, nerves, and muscles and even death. Factors influencing the effects of electrical shock include the type of current, voltage, resistance, amperage, pathway through body, and the duration of contact. The longer the current flows through the body, the more serious the injury. Injuries are less severe when the current does not pass through or near nerve centers and vital organs. Electrical accidents usually occur as a

result of faulty or defective equipment, unsafe installation, or misuse of equipment on the part of office workers.

For additional requirements concerning electrical safety refer to section 11.7

Types of electrical hazards found in an office environment include the following:

6.5.1 *Ungrounded Equipment*

Grounding is a method of protecting employees from electric shock. By grounding an electrical system, a low-resistance path to earth through a ground connection is intentionally created. When properly done, this path offers sufficiently low resistance and has sufficient current-carrying capacity to prevent the build-up of hazardous voltages. Most fixed equipment such as large, stationary machines must be grounded. Cord and plug connected equipment must be grounded if it is located in hazardous or wet locations, if operated at more than 150 volts to ground, or if it is of a certain type of equipment (such as refrigerators and air conditioners). Small appliances, such as toasters and coffee pots, would generally not fall into these categories and therefore would not have to be grounded. However much of the newer office equipment is manufactured with grounded plugs as a precaution (three prong plugs). In such cases, the equipment should be used in accordance with the manufacturer's instructions. In any case, never remove the third (grounding) prong from any three-prong piece of equipment.

6.5.2 *Overloaded Outlets*

Insufficient or overloading of electrical outlets should be avoided. A sufficient number of outlets will eliminate the need for extension cords. Overloading electrical circuits and extension cords can result in a fire. Floor mounted outlets should be carefully placed to prevent tripping hazards.

6.5.3 *Unsafe/Non-Approved Equipment*

The use of poorly maintained or unsafe, poor quality, non-approved (by national testing laboratory) coffee makers, radios, lamps, etc. (often provided by or used by employees) should be discarded. Such appliances can develop electrical shorts creating fire and/or shock hazards. Equipment and cords should be inspected regularly, and a qualified individual should make repairs.

6.5.4 *Defective, Frayed or Improperly Installed Cords for Electrical Office Equipment*

When the outer jacket of a cord is damaged, the cord may no longer be water-resistant. The insulation can absorb moisture, which may then result in a short circuit or excessive current leakage to ground. If wires are exposed, they may cause a shock to a worker who contacts them. These cords should be replaced. Electric cords should be examined on a routine basis for fraying and exposed wiring.

6.5.5 *Improper Placement of Cords*

A cord should not be pulled or dragged over nails, hooks, or other sharp objects that may cause cuts in the insulation. In addition, cords should never be placed on radiators, steam pipes, walls, and windows. Particular attention should be placed on connections behind furniture, since files and bookcases may be pushed tightly against electric outlets, severely bending the cord at the plug.

6.5.6 *Electrical Cords across Walkways and Work Areas*

An adequate number of outlet sockets should be provided. Extension cords should only be used in situations where fixed wiring is not feasible. However, if it is necessary to use an extension cord, never run it across walkways or aisles due to the potential tripping hazard. If you must run a cord across a walkway, either tape it down or purchase a cord runner.

6.5.7 *Live Parts Unguarded*

Wall receptacles should be designed and installed so that no current-carrying parts will be exposed, and outlet plates should be kept tight to eliminate the possibility of shock.

6.5.8 *Pulling of Plugs to Shut Off Power*

Switches to turn on and off equipment should be provided, either in the equipment or in the cords, so that it is not necessary to pull the plugs to shut off the power. To remove a plug from an outlet, take a firm grip on and pull the plug itself. Never pull a plug out by the cord.

6.5.9 *Working on "Live Equipment"*

Disconnect electrical machines before cleaning, adjusting, or applying flammable solutions. If a guard is removed to clean or repair parts, replace it before testing the equipment and returning the machine to service.

6.5.10 *Blocking Electrical Panel Doors*

If an electrical malfunction should occur, the panel door, and anything else in front of the door will become very hot. Electrical panel doors should always be kept closed, to prevent "electrical flashover" in the event of an electrical malfunction. Maintain a unobstructed zone of at least 36” in front of all electrical panes.

6.6 Office Fire Prevention Strategies

The best time to think about fire safety is before a fire starts. Learn the location of fire escape routes and how to activate the fire alarm. Participate in practice fire drills on a regular basis. Become familiar with stairway exits - elevators may not function during a fire, or may expose passengers to heat, gas and smoke.

- Heat-producing equipment - copiers, work processors, space heaters, coffee makers and hot plates - are often overlooked as a potential fire hazard. Keep them away from anything that might burn.
- Electrical appliances can be fire hazards. Be sure to turn off all appliances at the end of the day. Use only grounded appliances plugged into grounded outlets (three prong plug).
- If electrical equipment malfunctions or gives off a strange odor, disconnect it and call the appropriate maintenance personnel. Promptly disconnect and replace cracked, frayed, or broken electrical cords.
- Keep extension cords clear of doorways and other areas where they can be stepped on or chafed and never plug one extension cord into another.
- Do not allow combustible material (boxes, paper, etc.) to build up in inappropriate storage locations (near sources of ignition).

6.6.1 *Fire Extinguishers*

Personnel shall use fire extinguishers:

- Only if properly trained and within their comfort zone to do so.
- According to instructions.
- To fight small fires only

- To fight fires only if there is no threat to the fire fighter or others
- Only if there is a clear exit route

Space/equipment owners shall ensure that fire extinguishers in their organization (including vehicles):

- Are serviceable.
- Are properly installed (consult the facilities support contact for assistance).
- Are not loose, freestanding, or used as doorstops.
- Are inspected monthly per NFPA 10 guidance.

Note: Building managers are responsible for inspecting common areas and other space that they own.

Space owners should ensure that the:

- Fire protection contact or Facility Safety Coordinator is consulted to obtain a new fire extinguisher or to report the discharge of a fire extinguisher.

Through a program of scheduled inspections, unsafe conditions can be recognized and corrected before they lead to serious injuries. Take a few moments each day to walk through your work area. Look for items previously pointed out, such as objects protruding into walkways, file cabinets that are weighted toward the top or frayed electrical cords. Advise personnel in the area of the hazards and set about correcting them.

6.7 Emergency Preparedness

One result of the recent trend toward open office environments is that smoke from office fires is not contained or isolated as effectively as in less open designs. Open office designs allow smoke to spread quickly and the incorporation of many synthetic and other combustible material in office fixtures (such as furniture, rugs, drapes, plastic wastebaskets, and vinyl covered walls) often makes "smoky" fires. In addition to being smoky, many synthetic materials can emit toxic materials during a fire. For example, cyanide can be emitted from urethane, which is commonly used in upholstery stuffing. Most burning materials can emit carbon monoxide. Inhalation of these toxic materials can severely hamper an office worker’s chances of getting out of a fire in time. This makes it imperative for office workers to recognize the signal to evacuate their work area and know how to exit in an expedient manner.

The local emergency action plan will address potential emergencies that can be expected in your work area. For emergency evacuation, the use of floor plans or workplace maps that clearly show the emergency escape routes and safe or refuge areas are included in the plan. All employees must understand what actions they are to take in the work area and assemble in

their designated assembly location. All new employees should receive training on how they should respond to emergencies from their supervisors shortly after starting work and whenever their responsibilities under the plan change. This orientation should include:

- Identifying the Building Emergency Team (BET) member and other individuals responsible for various aspects of the emergency plan (chain of command) so that in an emergency, confusion will be minimized and employees will have no doubt about who has authority for making decisions.
- Identifying the method of communication that will be used to alert employees that an evacuation or some other action is required as well as how employees can report emergencies (such as location of manual pull stations, public address systems, telephones, etc.).
- Identifying the evacuation routes from the building and assembly points where employees will gather.
- Explanation of emergency warning signals and the immediate actions to be taken for each.

General guidance for fires and related emergencies includes:

- If you discover a fire or see/smell smoke, immediately follow these procedures:
    a. Notify the local Fire Department
    b. Notify Security or Building Security Force
    c. Activate the building alarm (fire pull station). If not available or operational, verbally notify people in the building.
    d. Isolate the area by closing windows and doors and evacuate the building, if you can do so safely.
    e. Shut down equipment in the immediate area, if possible.
    f. If possible and if you have received appropriate training, use a portable fire extinguisher to:
        - Assist oneself to evacuate;
        - Assist another to evacuate; and
        - Control a small fire.
    g. Do not collect personal or official items; leave the area of the fire immediately and walk, do not run to the exit and designated gathering area.
    h. You should provide the fire/police teams with the details of the problem upon their arrival. Special hazard information you might know is essential for the safety

of the emergency responders. You should not re-enter the building until directed to do so. Follow any special procedures established for your unit.

i. If the fire alarms are ringing in your building, you must evacuate the building and stay out until notified to return. Move to your designated meeting location or upwind from the building staying clear of streets, driveways, sidewalks, and other access ways to the building. If you are a supervisor, try to account for your employees, keep them together and report any missing persons to the emergency personnel at the scene.

If an individual is overexposed to smoke or chemical vapors, remove the person to an uncontaminated area and treat for shock. Do not enter the area if you suspect that a life threatening condition still exists (such as heavy smoke or toxic gases). If CPR certified, follow standard CPR protocols. Get medical attention promptly.

If your or another person's clothing catches fire, extinguish the burning clothing by using the drop-and-roll technique, wrap victim in a fire blanket or douse victim with cold water (use an emergency shower if it is immediately available). Carefully remove contaminated clothing; however, avoid further damage to the burned area. Cover injured person to prevent shock. Get medical attention promptly.

7.0 RADIATION PROTECTION

7.1 Introduction

It is the responsibility of the Office of Secure Transportation (OST) to inform Federal Agents of potential occupational radiological hazards and of the actions taken to control the radiological hazards to employees and the public. If not understood and controlled, radiation emitted from radioactive material could pose a hazard to employees. The amount of radiation received by OST employees is inherently below the levels allowed by applicable federal regulations and DOE orders. It is the responsibility of OST employees to understand the hazard and take appropriate actions to maintain their radiation exposure at a level as-low-as-reasonably-achievable (ALARA). The OST Radiation Protection Program (RPP) generally limits special agent radiation dose to no greater than that specified in 49 of the Code of Federal Regulations (CFR), Part 1732 Subpart I (as of October 2004) and follows as appropriate the guidance recommended in NCRP report number 59, *Operational Radiation Safety Program.* OST activities involving the transportation of radioactive materials are excluded from 10 CFR 835 , *Occupational Radiation Protection.*

The purpose of the OST RPP is to:

- Provide a basis for employee understanding of the potential hazards of ionizing radiation.
- Provide the policies for monitoring employee exposure to radiation.
- Provide for notifying employees of their exposure to ionizing radiation.
- Provide training for keeping employee and general public radiation exposure level(s) ALARA.
- Provide the framework for the review and audit of the Radiation Protection Program and ALARA goals.

7.2 Radiation Protection Policy and Program

OST radiation protection policy is consistent with DOE radiation protection policy defined in DOE P 441.1, *DOE Radiological Health and Safety Policy*. The OST Radiation Protection Program is defined in OST *Radiation Protection Program*, Revision 0, July 1997.

7.2.1 *ALARA*

Employee radiation exposure shall be maintained ALARA with economic and social factors being taken into account.

Radiation exposure to the work force and the public shall be restricted such that radiation exposures are maintained well below federal regulatory limits.

7.2.2 *Ownership*

Employees involved in the transportation of radiological material are expected to demonstrate responsibility and accountability through an informed, disciplined, and cautious attitude toward radiation and radioactive contamination.

7.2.3 *Excellence*

Excellent performance is evident when radiation exposures are maintained well below regulatory limits, contamination is minimal, radioactivity is well controlled and radiological spills or uncontrolled releases are prevented.

Continuing reduction of radiation exposure is essential to excellence in radiological control.

7.3 Manager Responsibilities

7.3.1 *ES&H Branch*

The Environment Safety and Health Branch (ESHB) of OST is responsible for defining and managing the office's Radiation Protection Program (RPP). The ESHB Chief serves as the manager for RRP. The RPP manager's authority and responsibilities include:

- Investigate radiation exposure anomalies including exposures to OST employees greater than 100 millirem (mrem) per year and review personnel dosimetry data for substantive, unexplained radiation exposure increases.
- Schedule the performance of internal radiation-related audits.
- Distribute radiation-exposure information to management and personnel.
- Serve as point of contact with NNSA Service Center
- Maintain the RPP in accordance with ALARA principles.

7.3.2 *Support Branch*

The OST maintains a Radiological Training Program, managed by the Training and Logistics Division, as described in this chapter.

7.4 Employee Responsibilities

Radiation protection responsibilities for OST employees include the following:

- Employees shall be aware of designated radiological controlled areas. Employees are not authorized to enter radiological areas unless escorted by designated site personnel, and unless provided with suitable radiological protection equipment, clothing, and instruction. A radiological controlled area is any area so marked and is an area where employees are not expected to receive a Total Effective Dose Equivalent (TEDE) of more than 100 mrem in a year.
- Employees shall wear their dosimeters properly when entering radiation areas, high radiation areas, and very high radiation areas.
- Employees shall ensure that their dosimeters remain on site, at designated locations, when not worn on official business.
- Employees shall obey posted radiological instructions and restrictions.

7.5 Dose Limits, Administrative Control Level, and Dosimetry Review Level of Radiation

7.5.1 *Dose Limits*

OST employees are not radiological workers, and they are not expected to receive greater than 100 mrem/year performing normal Federal agent work tasks and activities. Regulatory dose limits during OST transportation activities have been established, these are:

- OST employees shall not exceed 1.25 rem (annual effective dose equivalent) in any 3-month period or 5 rem in any 12-month period.
- The occupational radiation dose to an embryo-fetus in a pregnant female OST employee, who has declared her pregnancy to DOE, shall not exceed 500 mrem during the pregnancy. This limit shall be achieved by limiting the radiation dose to less than 50 mrem in any one month during the pregnancy period.
- Radiation exposures to members of the general public shall be less than 2 mrem/hr. This level will be measured as if an individual were present for an hour in any area where the general public could be exposed to radiation during the course of transportation. If the dose

rate to a member of the public exceeds 2 mrem/hr, OST will apply limits that will prevent a member of the public from receiving cumulative doses totaling 100 mrem in any week or 500 mrem in any 12-month period.

7.5.2 *Administrative Control Level*

DOE, in its effort to maintain radiation exposure in accordance with ALARA policy and conform to the practices recommended by the International Commission on Radiological Protection, has adopted an Administrative Control Level (ACL) of 2 rem (TEDE) per year. No OST employee shall be permitted to receive an occupational exposure during planned activities that would result in exceeding the DOE ACL without the specific written authorization of NADP-10 or designee.

7.5.3 *Dosimetry Review*

Exposures to OST employee(s) greater than 100 mrem per year or any exposure trend indicating a significant increase to OST employee(s) over previous periodic dosimeter measurements will be subject to a specific OST review.

OST must evaluate exposure to OST employees substantially greater than would be expected. OST will implement corrective measures to mitigate continued elevated radiation exposure, consistent with the OST ALARA policy.

7.6 Transportation of Radioactive Material

DOE orders require OST to follow 49 CFR 173, *Shippers - General Requirements for Shipments and Packagings,* that sets forth requirements for the packaging and transportation of radioactive material, all of which are requirements on the shipper and carrier. Each package or configuration containing radioactive material offered for transportation shall be designed and prepared for shipment so that, under conditions normally incident to transportation, the radiation level does not exceed the specified dose rate at any point on the external surface of the package. OST requires the shipper to certify and provide documentation of compliance to these requirements.

The OST has issued a Standard Operating Procedure (SOP) which provides the procedures for Federal Agents, including the documents they must carry, the pre-trip inspection and checklist, inspection of the tie-downs, accepting custody of the material to be transported, receipt/release forms, releasing custody, and post-trip checks. This SOP is a classified document.

OST Safety Policies requires DOE elements and their contractors and subcontractors to use OST Forms AL 5600.3A, B, and C. These forms pertain to the certification of shipments and vehicles involving the transportation of radioactive material. AL Supplemental Directive 5610.14 does not apply to the Department of Defense. DoD consignors and consignees do not fill out these forms. DOE consignors and consignees fill out and sign the forms and give them to the Federal Agents for inclusion in the trip file.

Completion of Form AL 5600.3, Shipment Certification/Vehicle Certification includes:

- Prior to departing with the shipment, a consignor's representative completes the "Shipment Certification" portion, which certifies that the materials in the shipment are properly described to OST, that hazardous materials are properly prepared and documented for transport, and that all containers are properly secured. If radioactive material is part of the shipment, the Shipment Certification states that dose rate levels do not exceed those specified in 49 CFR 173. The original of the Shipment Certification is signed by the consignor and given to the OST Special Agent, who accepts custody of the shipment.
- After delivery and prior to release of the vehicle to OST, a consignee's representative must complete the "Vehicle Certification" portion, which certifies that the vehicle used for transporting the shipment does not exceed the limits of radiation and radioactive surface contamination specified in 49 CFR 173. The original of the Vehicle Certification is signed by the consignee and returned to the OST Special Agent at the destination.

7.7 Dosimetry

7.7.1 *Dosimetry Requirements*

Employee dosimetry shall be required for the following:

- Employees involved in the transport of radioactive material.
- All OST employees that enter a radiological controlled area. A radiological controlled area is defined as any so designated and accessed controlled area under the jurisdiction of DOE plant or Department of Defense (DoD) radiological protection staff.

7.7.2 *Dosimeter Use*

OST RPP procedures to be followed are:

- Thermoluminescent dosimeters (TLDs) shall be issued only to employees formally instructed in their use and shall be worn only by those to whom the dosimeters were issued.
- Employees shall return dosimeters for processing as scheduled or upon request, and should be restricted by line management from continued transport or access until dosimeters are exchanged.
- Employees shall wear their dosimeters on the front of the torso, on or between the waist and the neck, in the manner prescribed by dosimetry personnel.
- TLDs shall not be taken off site (except when performing official duties requiring their use, such as during convoy operations where OST employees shall wear their assigned dosimeters).
- Employees shall always wear their assigned dosimeters while on duty and in the proximity of radiological cargo. Employees may be monitored and shall wear dosimeters issued to them by DOE plant or DoD radiological protection staff, as required.
- Employees shall not expose their dosimeters to excessive heat, to medical or security X-ray devices, or any other sources of ionizing radiation.
- An employee who has recently been treated with radiopharmaceuticals, or who is carrying medically implanted radioactive sources, should notify OST safety personnel.
- An employee whose dosimeter is lost or damaged should report the occurrence to his/her supervisor or OST safety personnel as soon as is practical, so that a replacement can be issued, and shall avoid working in the immediate proximity of radiation sources or radioactive material.
- The responsible OST supervisor shall train each employee in the possible consequence of inappropriate use or tampering with dosimeters.
- As part of the Personnel Dosimetry Program, new radiation dosimeters are issued to OST employees every 3 months. Both the new and old dosimeters shall be shipped to (or shipped back) through a service that can certify [to both Sandia National Laboratories (SNL) and each OST Federal Agent Facility] that it does not also transport radiopharmaceuticals or other radioactive materials. Such an assurance is necessary to preclude the possibility of inadvertent radiation exposure and incorrect readings of the dosimeters (Reference: Statement of Work between SNL and OST).
- As part of the Personnel Dosimetry Program, all OST employees who are responsible for transporting radiological material or who may routinely come in contact with sealed sources of radiation shall be trained to ensure understanding of the OST policy of ALARA, to ensure appreciation of radiological and contamination hazards from the cargo transported, and to ensure that the requirements for proper placement and care of dosimeters are understood.

- Although a routine Bioassay Program is not required due to the safety afforded through packaging, a special Bioassay Program shall be instituted if an accident or emergency situation indicates the potential for internal uptake.

7.8 Training and Qualification Requirements

OST employees are trained on several radiological protection modules. All three training modules must be completed successfully, which includes demonstration of a passing grade.

7.9 Employee Radiological Records

The following requirements for documentation apply to employee radiological records:

- Records of doses received by all employees for whom individual monitoring was performed shall be maintained indefinitely, or until transferred to the custody of another accredited Radiological Protection Program for personnel. These records shall be sufficient to evaluate compliance with all applicable dose limits and monitoring and reporting requirements.
- Radiation dose records shall contain information sufficient to identify each employee, including social security number.
- Routine and special records related to radiation doses shall be retained by OST for each employee monitored. This shall include records of zero dose. Procedures, data, and supporting information needed to reconfirm an employee's dose shall be maintained for possible review at a later date.
- External dose records are maintained by SNL and are in accordance with the SNL RPP.
- Internal dose records shall include the following:
  - Applicable whole body and lung counting results (including chest wall thickness measurements, where applicable).
  - Applicable urine, fecal, and specimen analysis results, including estimated intake and identity of radionuclides.
  - Dose assessment, as required.
- Counseling of employees about radiological concerns should be documented and this documentation retained. It is desirable that the counseled employee signs the documentation to acknowledge participation.

7.10 Radiological Reporting

7.10.1 *Reports to Employees*

Radiological reporting for OST employees includes the following:

- Employees who are monitored by the Radiation Protection Dosimetry Program shall be provided an annual report of their dose. Upon request, an employee shall receive a current radiation dose record [10 CFR 835.801.c (d)].
- Terminating employees shall be provided a report, within 90 days of the last day of employment that summarizes radiation dose for the total period of employment at the reporting facility. A written estimate, based upon available information, shall be provided upon termination, if requested.
- Reports of employee doses include the site or facility name, the employee's name and social security number, employee number, and all dose information required by 10 CFR 835.

7.10.2 *Sandia National Laboratories (SNL) Support*

OST Dosimetry Program support is provided by SNL located in Albuquerque, New Mexico.

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8.0 FIREARMS SAFETY

8.1 Introduction

To provide security for vital assets, OST personnel are often armed while on duty. This chapter outlines requirements to prevent injuries and illness that could result from operations involving firearms.

8.2 General Firearms Safety

OST personnel involved with firearms will comply with the following requirements:

Job Classification or Assignment	Requirements
Managers of Federal Agents	• Ensure that firearms are used in a manner that ensures safety of employees, contractors, and the public. • Allow only firearms and ammunition approved by DOE to be used by on-duty personnel. • Develop site-specific plans, policies, procedures or equivalent documents, lesson plans, or manuals for the safe storage, handling, and use of firearms and ammunition. • Assess all operations involving firearms and ensure that associated risks are acceptable and consistent with training and operational requirements. • Ensure that supervisors, range masters, range safety officers, armorers, firearms instructors, and Federal Agents receive training necessary to meet their responsibilities.
Supervisors	• Ensure that personnel being supervised comply with all firearms safety policies, rules, and procedures. • Restrict individuals who may be in a state of mental or physical deterioration from participating in any firearms operation or training.

Job Classification or Assignment	Requirements
Range masters	• Conduct emergency response drills at least annually at each site. • Provide overall management and administration of live-fire range facilities to ensure that all operations and training are conducted in accordance with applicable DOE orders.
Firearms instructors	• Be certified by the DOE National Training Center. • Develop and use lesson plans for all firearms training activities, to include: – A risk assessment. – Safety requirements. – Training objectives and task performance standards. – Remedial training. • Ensure that training records for personnel authorized to carry firearms are properly annotated to reflect current training. • Have available an instruction manual for each type of firearm that may be used at each site. • Comply with DOE Firearms Qualifications Courses Manual (DOE M 473.2-1A). • Be trained in: – Cardiopulmonary resuscitation (CPR). – First aid. – Handling bloodborne pathogens. – Handling gunshot wounds.
Armorers	• Be certified by the DOE National Training Center, as well as a factory-authorized course for each type of firearm assigned to the organization they support. • **Not** modify any firearms unless written approval is received from DOE. • Inspect and certify for use all firearms available for duty issue semi-annually. • Maintain individual records for each firearm to include inspection dates, nature and date of any repair, and records of test firings. • Inspect and conduct test firings of affected firearms following any unusual operation, occurrence, or functional

Job Classification or Assignment	Requirements
	repairs. • Tag as "out-of-service" any firearm that experiences an unusual operation, and segregate it from operational firearms until certified as safe to use.
Federal Agents	• Demonstrate technical and practical knowledge of the contents of instruction manuals for each type of firearm used. • Wear required personal protective equipment (PPE). • Immediately report the following to a range officer, controller, or supervisor: – Unsafe acts or conditions. – Injury or illness incurred during any firearms operation, training, or exercise. – Personal condition, such as an illness or use of medication that could affect your ability to handle firearms safely.

8.3 Reporting

OST personnel 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 including injuries	Report immediately to a supervisor. **Note:** If the unusual or unsafe acts, conditions, or operations occur at a live-fire range or during an engagement simulation systems (ESS) or dye marking cartridge (DMC) exercise, immediately report to a range officer or controller rather than a supervisor.
Unauthorized discharge of firearms	Report immediately to a supervisor, range officer, or controller.

OST personnel who serve in a supervisory position shall, upon receiving a report of unusual or unsafe acts or conditions:

- Take the necessary emergency or corrective actions.
- If warranted, preserve the scene. Make proper notifications up channel. Submit reports as the situation dictates and in accordance with applicable DOE orders.

8.4 Safety and Risk Assessment

Managers shall:

- Ensure the performance of a safety analysis, safety assessment, or risk assessment for all facilities, operations, exercises, and activities involving the use, transportation, or storage of firearms or related ammunition (see Crad 4). The type and depth of analysis depend on the level of hazards present.
- Ensure that analysis reports are approved before implementing any new operations, training, or exercises.

8.5 Personal Protective Equipment (PPE)

OST personnel who are participants, instructors, or observers in the following situations shall wear appropriate PPE:

- During live-fire training or qualification.
- During all DMC activities
- When blanks are used in exercises involving ESS equipment.
- During all firearms cleaning operations

- A risk assessment must determine the appropriate type of PPE required for the specific DMC PT/training activity being conducted. At a minimum, the following PPE must be used when conducting training/PTs involving the use of DMC during FOF and man-on-man engagements.
    a. Eye protection.
    b. Full face and head protection, which includes covered protection for the ears (i.e., helmets specifically designed for use with DMC).
    c. Hand protection (gloves).
    d. Groin protection.
    e. Throat protection.
    g. Hearing protection (optional).

Note: The following PPE are considered appropriate for the circumstances described above:

- Eye protection meeting ANSI Z87.1-1989.
- Hearing protection with a minimum noise reduction rating (NRR) of 26 for live-fire activities.

NOTE: Sound levels generated by DMC use are below OSHA requirements which require hearing protection.

Additionally, OST personnel shall wear:

- Clothing that is appropriate for the conditions during exercises.
- Gloves, long-sleeve shirts, and full-length pants during exercises involving crossing or climbing over barbed wire fences.

8.6 Range Safety

All personnel shall follow range safety rules during training at live-fire ranges.

Range masters shall:

- Develop and implement site-specific range safety rules that address site-specific hazards and procedures. These rules shall address the availability of communications systems and procedures for:
  - Handling duds and misfires.
  - Using steel targets.
  - Collecting unexpended ammunition.
  - Collecting and disposing of spent cartridges.
  - Cleaning firearms.
  - Developing plans for each live-fire range for the quick handling, treatment, and evacuation of injured personnel by air or ambulance.
- Ensure that appropriate medical equipment is available at each live-fire range as determined by the site's medical support organization.
- Ensure that site-specific range safety rules and regulations are conspicuously posted at all DOE-controlled live-fire ranges.

Range officers and firearms instructors shall:

- Ensure that all firearms training, qualification, practice, and test firing are conducted in accordance with approved lesson plans and site-specific requirements and procedures.

- Conduct a safety briefing for participants and observers before each shooting session to include basic range safety rules and all relevant safety-related procedures, as well as a reminder that they shall not be under the influence of drugs (including over-the-counter, or prescription) or alcohol.
- Maintain the required instructor-to-shooter ratio for the type of shooting being performed.
- Enforce compliance with relevant safety rules and procedures, and the use of required safety equipment during training activities.

8.7 Dye Marking Cartridges (DMC) and Engagement Simulation System (ESS) Exercises

Managers shall ensure that DMC and ESS exercises are conducted according to an exercise-specific safety plan. Depending on the level of risk, managers shall approve and ensure that exercise plans:

- Include associated risk assessment.
- Are reviewed by safety and site training representatives.

Exercise directors or designated controllers shall provide a segregated, sanitized storage area for DMC and ESS equipment.

Senior controllers shall:

- Brief all participants, controllers, and observers on specifics of the exercise, their duties, and safety requirements, before the start of any exercise.
- Govern all activities during exercises, with the assistance of other controllers as needed.

Controllers shall:

- Inspect exercise firearms prior to each exercise, ensuring that the firearms are clearly marked and are kept separate from live firearms.
- Positively ensure that live ammunition is not introduced into an exercise area.

8.8 Loading and Unloading of Firearms

Each site shall have an approved procedure for the loading and clearing of firearms which shall take place only in an approved area or when the barrel of the firearm is in or pointing toward a bullet containment device. The procedure shall include instructions (i.e., safe area) when no

bullet containment device is available. The routine loading and clearing of all firearms shall be witnessed by a supervisor. For further information, see DOE-STD-1091-96, *Firearms Safety.*

8.9 Exposure to Hazardous Material and Environments

Managers of security shall ensure that:

- Airborne lead levels are measured annually at live-fire ranges.
- Material Safety Data Sheets (MSDS) for each hazardous material are readily available for review at each location where the hazardous material is used.
- Shooters shall receive training for lead hazards and protective measures.
- OST personnel wear the appropriate (PPE) when:
  - Shooting in training situations.
  - Cleaning firearms.
- Shooters shall receive training on the effects of noise, hearing loss protective measures, and the correct use of hearing protection.
- Shooters, instructors, and observers wear hearing protection when shooting is in progress.
- Federal Agents and Firearms Instructor personnel receive baseline and annual hearing tests.

Training officers at each site shall provide training on hazards and hazardous material; topics shall include:

- Hazard communication.
- Hazardous material orientation.
- Noise hazards and use of hearing protection.
- Hazards of lead and methods to mitigate risks.
- Hazards from solvents.
- Fetal protection.

8.10 Influence of Drugs and Alcohol

Managers shall:

- **Not** allow people under the influence of drugs (to include prescription and/or over-the-counter) or alcohol to handle or carry firearms.
- Ensure that supervisors and firearms instructors receive training on how to identify individuals who may be under the influence of drugs or alcohol, or may display other forms of aberrant behavior.

8.11 Storage and Transportation of Firearms and Ammunition

Managers shall:

- Develop site-specific plans or procedures for the safe storage and transportation of firearms and ammunition.
- Ensure that procedures comply with the requirements in DOE M 440.1-1, *DOE Explosives Safety Manual.*

OST personnel who carry firearms inside a vehicle for operational purposes shall carry the firearms on their persons or secure the firearms in racks or other suitable containers.

9.0 MOTOR VEHICLE SAFETY

9.1 Requirements

The Department of Energy (DOE) requires that elements implement a Motor Vehicle Safety Program. The purpose of this Program is to protect the safety and health of drivers and passengers in government-owned or government-leased motor vehicles and powered industrial equipment.

9.2 Manager Responsibilities

Managers shall ensure that:

- Operators of government vehicles, government-leased vehicles, and powered motorized equipment have a valid license for the type vehicle or equipment they operate and for the appropriate state. As a minimum, operators who drive any type vehicle or motorized equipment on any road to which the public has access must possess a valid state driver's license.
- Operators are properly trained prior to operating any type vehicles or motorized equipment. Training must meet all the federal and state regulatory requirements for the type equipment. When required, provisions will be made to provide hands-on training as well as road tests.
- Procedures are in place for the maintenance of vehicles and equipment.
- Operators are physically and medically qualified to operate vehicles.
- Vehicle accidents are investigated and reported.
- Operators who are involved in preventable on-duty vehicle accidents receive appropriate retraining or counseling.

9.3 Requirements for Operators of OST Tractors and SST/SGT Trailers

All divisions of the Office of Secure Transportation (OST) must comply with the requirements stated here for the certification of drivers of OST tractor/trailers.

These requirements apply to all drivers covered under the Federal Motor Carrier Safety Regulations as prescribed by the U.S. Department of Transportation Federal Highway Administration, 49 Code of Federal Regulations (CFR) Parts, 383, 387, and 390 through 399. Included are any DOE federal employees, DOE contractors and Department of Defense

contractors who operate or maintain OST tractor/trailers or affect the operation of this equipment.

9.3.1 *Drivers*

Drivers, who, as part of their duties, drive OST vehicles that fall under the commercial motor vehicle category, must possess a commercial driver's license with an HAZMAT endorsement. Drivers will inspect tiedowns to ensure that they are in compliance with *OST Tiedown Procedures for Type-B Containers,* and with DoD Technical Manual 45-51D, *Transportation of Nuclear Weapon Material*.

9.3.2 *Office of Mission Operations*

The Office of Mission Operations (OMO) will assign a certified driving instructor after receiving a request in writing from the respective contracting agent, to examine and certify new drivers who meet all of the Federal Motor Carrier Safety Regulations as required.

9.3.3 *Responsibilities of the Safety, Security, and Emergency Management Division*

The Safety, Security, and Emergency Management Division (SSEMD) will monitor compliance with policy regarding safety and accident investigation. The SSEMD will also review accident reports involving OST motor vehicles and recommend resolutions to safety problems.

9.3.4 *Additional Supervisor and Driver Responsibilities*

The supervisor of drivers operating OST tractors and trailers will submit a written request to the Manager of the OMO for initial (first time) driving certification. A subsequent certification will not be required unless a deficiency or accident require a recertification of an individual, at which time the Office of Mission Operations will be advised in writing.

Operators shall report all accidents involving OST vehicles to their supervisor or manager for further reporting in accordance to DOE Occurrence Reporting requirements.

9.4 Responsibilities of All Operators

OST personnel who operate vehicles or motorized equipment on-duty shall:

- Use government vehicles and equipment only for official purposes.

- Possess a valid driver's licenses while operating a vehicle or a piece of motorized equipment.
- Comply with the applicable laws, speed limits, and traffic control signs and devices.
- Make sure that they and their passengers fasten seat belts and shoulder harnesses whenever the vehicle is in motion.
- **Not** wear portable headphones or similar devices used for entertainment when operating a vehicle or a piece of equipment.
- Check vehicles and equipment for safe operation before use.
- Become familiar with all controls before operating any vehicle.
- Report all accidents involving vehicles or motorized equipment to their manager.
- Report to their manager any traffic citation issued to them while operating a government vehicle.
- Drive defensively and exercise caution especially when driving on unfamiliar roads, at night, and in inclement weather.
- Drive at a safe speed appropriate to road and weather conditions, but **not** exceed posted speed limits.
- Park vehicles and equipment only in authorized or designated areas and set the parking brake.
- Not leave vehicles running unattended.
- Yield to emergency vehicles.
- Whenever backing a tractor/trailer, a spotter on the ground is required.

9.5 Accident Review Committee

The OST Accident Review Committee (see ES&H Policy 7.01) is organized and chartered to assist the Safe Driving Awards Program by reviewing all pertinent information of an accident involving Federal Agents to determine whether the accident was preventable or non-preventable. The Accident Review Committee will also review all OST accidents involving federal employees and contractor employees to determine any recommended corrective actions to prevent a recurrence or mitigate the results. The Committee will assist management in providing accident trending and recommend safe driving practices (see **Annex 1**).

These requirements apply to all OST federal employees involved in vehicle accidents on official business.

9.5.1 *Composition of Accident Review Committee*

All members of the OST Accident Review Committee (ARC) shall be DOE employees. Other OST employees are welcome to attend Committee meetings. Membership of the ARC consists of the following:

- ARC Chair - Safety Engineer from the SSEMD (voting when necessary for tiebreakers).
- Training & Logistics Division Driving Instructor (voting).
- Engineering Systems & Technology Division, Vehicle Systems Branch (voting).
- One Unit Commander or Deputy Unit Commander from each Command (two voting/one non-voting).
- Safe Driving Awards Coordinator or representative (non-voting).

9.5.2 *Meeting Information*

Specifics of the ARC meeting include the following:

- The ARC will convene every 3 months unless otherwise required by the responsibilities defined here.
- The chairperson will consider the workloads of each ARC member when scheduling a meeting. Meetings may be conducted via teleconference.
- The format of the meeting shall allow members to review accidents based on all available information. Members are free to voice their opinions.

9.5.3 *Committee Procedures*

Specified ARC procedures are:

- The ARC will evaluate all reports on vehicle accidents. Only those cases will be reviewed for which the investigation is complete and all information has been assembled.
- The Committee will use all findings, conclusions, and recommendations to determine whether an accident was preventable or non-preventable.
- The ARC will refer to the National Safety Council guide, titled *A Guide to Determine Motor Vehicle Accident Preventability*, in making its determinations on accidents.
- The ARC will evaluate and make recommendations on issues involving vehicle safety as introduced by any of the members, or by OST federal employee personnel. Examples of such issues are safety suggestions, proposed changes to procedures, new procedures and risk assessments.

- The ARC will also review and evaluate concerns on deficiencies related to the Vehicle Safety Program, and provide recommendations to the OMO Manager on the safe operation of vehicles.
- When an issue is to be voted on, each voting member of the ARC will have a vote. An ARC member from a Command will not vote on accidents involving Federal Agents from the same Command. A majority vote is required to pass any issue.

9.5.4 *Appeals*

Procedures for an employee to appeal an ARC decision of an accident are outlined in the *Safe Awards Administrative Guide.*

9.6 Inspection of Vehicles and Motorized Equipment

Operators shall ensure that all vehicles and motorized equipment are in safe operating conditions before they place them in service.

9.6.1 *Commercial Vehicles*

Drivers of commercial vehicles as defined in the Federal Motor Carrier Safety Regulations shall inspect their vehicles as required in these regulations. Records of inspections are maintained as required in these regulations.

9.6.2 *Motorized Equipment*

Operators of motorized equipment shall inspect this equipment as specified by the manufacturer and as required by the Occupational Safety and Health Standards, 29 CFR Parts 1910.178 (q)(7). Records of these inspections will be maintained either on the equipment or in a central location.

9.6.3 *Fifteen Passenger Vans*

To reduce the risk of roll over crashes in 15 passenger vans, do not transport more than 10 passengers at a time.

9.6.4 *Other Vehicles*

Drivers of vehicles not included above must ensure that the vehicles they drive are in a safe operating condition and that all safety equipment is in good condition. As a minimum, the following should be in safe, working condition:

- Seat belts and shoulder harnesses.
- Windshield and side and rear windows.
- Windshield wipers.
- Rearview mirrors.
- Horn.
- Headlights (both bright and dim settings).
- Turn signals.
- Stop lights.
- Backup lights.
- Brakes.
- Parking brake.
- Seats, seat adjustments, and headrests.
- Tires.
- Fluid levels.

10.0 EXPLOSIVES SAFETY

10.1 Policy and Compliance Requirements

Department of Energy (DOE) policy requires that all DOE activities, including those involving explosives, be conducted in a manner that protects the safety of the public and provides a safe and healthful work place for employees. The level of safety provided shall be at least equivalent to that of the best industrial practice. The risk of death or serious injury shall be limited to the lowest practicable level. DOE elements and contractors shall continually review their explosives operations with the aim of further refining and improving safety practices and protective features.

Office of Secure Transportation (OST) employees are involved in three types of explosives operations involving:

- Small arms ammunition and other explosive devices that are stored, transported, and used in training for Federal Agents.
- Federal Agents who are armed and carry ammunition and other explosive devices with them for the protection of DOE resources.
- The transportation of explosives-containing devices. While these operations involve explosives that are relatively safe, OST must comply with all the explosives requirements that apply to these operations.

Mandatory requirements for operations involving conventional explosives are contained in the following:

- 29 CFR 1910.109, *Explosives and Blasting Agents*
- 49 CFR 100-180, *Hazardous Material Regulations*
- 49 CFR 390-397, *Federal Motor Carrier Safety Regulations*
- DOE M 440.1-1, *DOE Explosives Safety Manual*
- DOE Standard 1091-96, *Firearms Safety*
- DOE M 473.2-2, Protective Force Program Manual

OST managers, supervisors, and other employees who are involved in explosives operations are required to understand and comply with the requirements in these documents. The DOE Albuquerque Operations Office (DOE/AL) Explosives Safety Officer can provide assistance in interpreting and implementing the requirements. This individual also provides oversight of OST operations that involve explosives to ensure compliance with requirements.

10.2 General Precautions

With the exception of emergencies or unusual circumstances, such as those that may occur at the live-fire range, OST personnel handle only explosives that are in a safe configuration. Precautions are necessary, however, to ensure that unsafe conditions are not caused by the mishandling of explosives or from exposing them to unsafe environments. These precautions shall be followed when dealing with explosives:

- No person shall store, handle, or transport explosives when such operations would constitute an undue hazard to life.
- Operations should be planned and arranged to minimize the handling of explosives and to minimize the distances they are carried.
- The distance that explosives could fall if accidentally dropped shall be kept at a minimum.
- Containers shall be labeled to the show contents during handling, storage, and transportation.
- Smoking and open flames are not permitted in areas or vehicles where explosives are stored, transported, or used.
- Any mechanical handling equipment used to lift or carry explosives shall be suitable for the task, periodically inspected, and properly maintained.
- One person may lift or carry up to 25 kilograms (kg) of explosives if the container can be securely gripped. Two people may lift or carry up to 50 kg of explosives, if manual lifting and handling tooling is provided. Any explosive item over 50 kg, or that cannot be securely gripped, should not be handled manually.
- Explosives, including ammunition, should be carried in a suitable container.
- Personnel shall be properly trained before they are required to perform any operations involving explosives.

10.3 Storage

At each OST site, the storage of explosives will be in full compliance with DOE M 440.1-1, *DOE Explosives Safety Manual*. Particular attention will be paid to the siting, construction, and maintenance of storage facilities and magazines. The DOE/AL Explosives Safety Officer can provide guidance on the storage compatibility of materials and quantity limits for each facility. The Explosives Safety Officer shall be consulted before any changes are made to storage facilities or procedures. To ensure that storage requirements are being met and materials have not deteriorated, site-specific plans will be developed to review the explosive materials stored at each site.

10.4 Transportation

Motor vehicle shipments on public highways are governed by Department of Transportation (DOT) regulations. All motor vehicle shipments from a DOE installation shall comply in full with applicable portions of DOT regulations, and with state and municipal regulations, except as provided for in DOE M 440.1-1. Some exemptions are made for Safe and Secure Trailers. Any motor vehicle that may be loaded with explosives (Hazard Class/Division 1.1, 1.2, and 1.3) and is designed for movement over public highways must be inspected and approved by a qualified inspector for compliance with an approved checklist. After loading, the lading must be inspected and approved. Driver selection, training, etc., for intra-plant shipping and for operation of Government-owned trucks on public highways shall be in accordance with pertinent requirements of 49 CFR 390-397.

Before motor vehicles loaded with explosive materials leave a DOE facility, drivers shall be informed of the nature of their cargo and methods of fighting fires involving the vehicle or its cargo.

All DOE explosives-carrying vehicles for onsite transportation should be equipped as follows:

- "Explosives Placards" plainly visible from all directions, except for vehicles transporting Class/Division 1.4 items.
- Tiedown bolts, rings, and straps of adequate strength to securely fasten explosive items.
- On trucks, a cargo area with no sharp projections. A non-sparking lining is desirable when hauling explosives in transfer containers that are not DOT approved.
- Chock blocks.
- A quick-disconnect on the battery, if explosives remain in the vehicle overnight.
- Rearview mirrors on both sides of the vehicle.
- Two fire extinguishers with a minimum rating of 2A:10BC, one of which should be mounted outside the vehicle. Vehicles transporting Class/Division 1.4 explosives are required to carry just one extinguisher.

Escort and response vehicles are authorized to transport the minimum quantity of munitions needed to support approved contingency plans and to execute their security duties.

Whenever possible, support munitions required for defense against hostile forces should be pre-positioned in readily accessible magazines.

Escort vehicles armed with a combination of up to 25 pounds net explosive weight of Hazard Class/Division 1.1 and 1.2 munitions shall be exempt from explosives quantity-distance requirements when executing approved contingency plans or security duties. Vehicles so

armed will not be used for administrative purposes. They will be separated from inhabited facilities and property lines by a minimum of 125 feet when temporarily out of security service, and shall be downloaded into properly sited magazines or approved facilities when parked for periods in excess of 4 hours. These vehicles will be downloaded into a properly sited magazine or approved facility prior to maintenance or repair except under emergency response conditions.

Federal Agents shall be allowed to transport on their person or in a vehicle the Hazard Class/Division 1.1, 1.2, and 1.3 munitions issued to them for personal use in the execution of approved contingency plans and security duties.

10.5 Occupational Safety And Health Considerations for Activities Involving Nuclear Explosives

Operations involving nuclear explosives present a potential for exposure to various occupational hazards, including high explosives, electro-explosive and pyrotechnic devices, high-pressure vessels with and without radioactive gases, radiological exposure, and chemical exposure, as well as routine industrial hazards.

In addition to complying with other safety and health requirements, nuclear explosive operations and associated activities and facilities shall comply with the following:

- DOE O 452.1B, *Nuclear Explosive and Weapon Surety Program*
- DOE O 452.2B, *Safety of Nuclear Explosives Operations*
- DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest*

Transportation activities involving nuclear explosives shall give appropriate consideration to occupational safety and health concerns (see Annex 7). Unique occupational hazards from the nuclear explosive operations and associated activities shall be identified and mitigated by the layout, process design of the operation, and the design of the associated tooling and equipment.

Implementation of the requirements to prevent or mitigate a hazard shall ensure that the likelihood of a safety significant incident involving another hazard is not increased. If any such instance is identified, alternative methods should be investigated to attempt to implement the requirement without increasing the risk associated with other hazards. Safety requirements that are not fully implemented because doing so would increase the overall risk of the operation will be identified and documented in the Safety Analysis Report for the facility or the Hazard Analysis Report for the operation.

Requests for exemptions from unique requirements shall be submitted for review to the NA-10, Defense Programs, per the listed DOE orders. Exemption requests shall include an assessment of the impact on the level of risk and on the compensatory measures.

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11.0 INDUSTRIAL SAFETY

11.1 Introduction

The mission of Department of Energy (DOE)/ Office of Secure Transportation (OST) does not involve industrial operations as such, but some activities do require the operation of machines, tools, and material handling (such as in shops, vehicle maintenance facilities, and armories) (see annex). This chapter addresses the requirements and procedures that are necessary to ensure the safety and health of personnel who are involved in this type of work. DOE orders and OSHA regulations are the source documents of all mandatory requirements. OST managers should consult safety and health professionals to assist them in the interpretation and implementation of these requirements.

11.2 Housekeeping

Good housekeeping reduces carelessness and clutter, which are common causes of fires and accidental injuries. It also provides a visual indication of a safe, efficient workplace and improves morale.

OST personnel shall keep all places of employment, passageways, storerooms, and service rooms clean, orderly, and in a sanitary condition. The floor of every work area shall be maintained in a clean and, as far as possible, a dry condition. To facilitate cleaning, every floor, workspace, and passageway shall be kept free from protruding nails, splinters, holes, or loose flooring materials. Good housekeeping practices include:

- Storing tools and materials properly.
- Picking up, wiping up, sweeping up, and removing scrap and waste materials.
- Keeping obstructions and combustibles away from electrical and electronic equipment.
- Keeping cabinet doors and drawers closed when not being used.
- Having broken furniture repaired or replaced.
- Cleaning messy areas and removing trash to a proper container.
- Eliminating tripping hazards.
- Keeping aisles, hallways, and exit routes free of clutter and obstructions.
- Preventing, watching out for, and avoiding slick walking surfaces.
- Keeping temporary storage out of aisles, hallways, exit routes, and work spaces.

11.3 Walking and Working Surfaces

At each OST work location, the organization or individual responsible for the facility shall ensure that all walking and working surfaces meet the OSHA requirements in regulation 29 CFR 1910.21 through 1910.30. These surfaces include floors, stairs, ramps, ladders, floor and wall openings, and rails. Individuals who observe hazards involving walking or working surfaces shall report these to their maintenance organization. At each site, the individual providing professional safety support can help interpret regulatory requirements.

Outdoor walking areas and paths require special attention. These areas need to be kept free of obstructions, loose gravel, or rocks and surfaces need to be free of tripping hazards. During the winter, outdoor walking surfaces should be kept free of snow and ice.

11.4 Fire Protection

OST managers shall ensure that a comprehensive Fire Protection Program is in effect at each OST site. The Program must meet the requirements in DOE O 420.1, *Facility Safety*, and address the fire protection needs of OST operations.

Each site should have written fire safety procedures governing the use and storage of combustible, flammable, and hazardous materials to minimize the risk from fire. Such procedures should also exist for fire protection system impairments and for activities such as smoking, hot work, safe operation of equipment, and other fire prevention measures that contribute to the decrease in fire risk.

OST personnel should be familiar with the fire protection requirements for their site and with the procedures for reporting fire hazards and emergencies. OST facilities will be characterized and posted in accordance with NFPA codes.

An acceptable Fire Protection Program includes those fire protection policies, requirements, technical criteria, analyses, administrative procedures, systems and hardware, apparatus and equipment, plans, and personnel that ensure that DOE objectives relating to fire safety are achieved. Such a Program should be characterized by a level of fire protection sufficient to fulfill the requirements for the "best protected" class of industrial risks, and the level of fire protection should provide "defense in depth". This means that an acceptable level of fire safety should be designed with both active and passive fire protection features such that reliance will not be placed on only one type of safeguard.

Effective fire protection is also characterized by the demonstration of a continuing, sincere, interest on the part of management and employees in minimizing losses from fire and related

hazards and the implementation of preventive features, necessary to ensure the satisfaction of objectives related to fire safety. The Fire Protection Program must include appropriate facility and site-wide fire protection, fire alarm notification, egress features, and access to a fully staffed, trained, and equipped fire department that is capable of responding in a timely and effective manner to site emergencies.

For fire protection programs that include portable fire extinguishers, managers shall ensure that only approved extinguishers are provided that meet the type of fire classes of anticipated fires. Portable fire extinguishers shall be visually inspected every month and are subject to an annual maintenance check. Managers shall ensure that individuals who are designated or who may use fire extinguishers are properly trained on their use. OST personnel will use fire extinguishers only in the beginning stages of a fire, and will refrain from doing so if it presents undue risk to them, or if the fire involves radioactive, highly toxic, or other unusually hazardous or unknown materials. If a fire is detected, the fire department shall be notified even if a fire extinguisher is used to extinguish the fire.

11.5 Means of Egress

Every building or structure, new or old, in which OST personnel work shall be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency. The design of exits and other protective features shall be such that reliance for life safety in any emergency will not depend solely on a single safeguard. Additional safeguards shall be provided for life safety in case any single safeguard is ineffective due to some human or mechanical failure.

At each site, the agency providing fire protection can also provide guidance on the requirements for exits and the adequacy of existing safeguards.

The number, type, location, and capacity of exits shall be appropriate to the specific building or structure, with due regard to the character of the occupancy, the number of persons exposed, the fire protection available, and the height and type of construction of the building or structure. In all cases, there must be adequate exits to afford all occupants convenient, unobstructed egress from all parts of the facility. Every exit shall be clearly visible, or the route to reach it shall be conspicuously indicated. Adequate and reliable illumination shall be provided for all exists and exit routes. Exits and exit routes must not be obstructed by stored materials or by equipment. No lock or fastening device shall be installed that would prevent free escape from the inside of any building.

In every building or structure of such size, arrangement, or occupancy that a fire may not itself provide adequate warning to occupants, fire alarms shall be provided.

11.6 Electrical Safety

The requirements for providing a workplace that is free of electrical hazards are contained in OSHA regulation, 29 CFR 1910, Subpart S, "Electrical.". OST operations shall be in compliance with applicable portions of this regulation. The Safety representatives of the ES&H Branch can provide guidance on the applicability and interpretation of provisions in the regulation.

At each OST site, the agency responsible for the facilities shall ensure that all wiring and electrical installations comply with the National Electrical Code, local building codes, and the OSHA regulation.

OST personnel shall not perform any electrical work or do any electrical modification unless they are trained and qualified and are authorized by their supervisor.

OST personnel shall not work on any energized electrical equipment or live parts. They shall ensure that work on de-energized electrical equipment is not conducted unless that equipment has been locked out and tagged out in accordance with the procedures in Section 11.11, "Lockout/Tagout," of this chapter.

OST personnel shall report to their supervisor any known or suspected electrical hazards such as defective equipment, exposed live parts, and frayed wires. They shall also report to their supervisor all incidents of electrical shock, not matter how minor, and consult a physician for evaluation.

All electrical equipment used by OST shall have a rating by a nationally recognized testing laboratory label (e.g., Underwriters Laboratory, [UL], Factory Mutual [FM], Canadian Standards Association [CSA], or equivalent).

Chapter 6 specifies requirements and guidance for electrical safety in office environments.

11.7 Machines and Power Tools

The requirements for machine guarding are in OSHA regulation 1910, Subpart O, "Machinery and Machine Guarding."

11.7.1 *Operator Training and Qualifications*

Managers shall ensure that OST personnel who operate any type of machine or power tool are properly trained and qualified to do so. Training must be provided for each specific machine

and power tool used. Individuals who use machines or power tools must read and understand any relevant manufacturer's instruction manuals and procedures before operating any equipment. Operators must know the following:

- Hazards associated with the machine or power tool.
- Methods to provide guarding for the machine or tool.
- Proper techniques to use, adjust, and maintain guards.
- Type of personal protective equipment (PPE) that is required and how to use it.
- Location of documentation and operating procedures.

11.7.2 *Establishing a Safe Work Environment*

Machines intended for use in a fixed location shall be installed according to the manufacturer's instructions and in accordance with the National Electric Code requirements, including proper grounding, protection for flexible cords, and secure conduit fittings.

A means of disconnecting each machine shall be provided and located, arranged, or marked so that its purpose is obvious.

Each machine that is designed for a fixed location shall be anchored securely to prevent it from moving.

Machines that might injure an operator if restarted after a power failure shall be equipped with a device that prevents them from automatically restarting.

Areas where machines and tools are used should be well illuminated, and should be kept free of obstructions, debris, scraps, and tripping hazards.

Materials and tools should be stored out of the way so as to prevent damage to them and to prevent them from becoming obstructions. Any required hazard or other warning signs should be conspicuously posted.

11.7.3 *Machine and Tool Guards*

One or more methods of guarding shall be provided to protect operators and other employees in the area from hazards such as those created by the point of operation, in-going nip points, rotating parts, flying chips, and sparks. Guards shall be affixed to the machine or tool, or secured elsewhere if for any reason attachment to the machine or tool is not possible. Guards shall be such that they do not present a hazard themselves. If a machine or tool does not have

a guard provided by the manufacturer, consult a safety professional before designing or installing a user-built guard.

Guards must be in good condition and must be in place before the machine or tool is put into operation. Power shall be disconnected before adjustments are made to guards. Operators should use hand-feed tools to place and remove material in the danger zone. Such tools shall not be used in lieu of other guarding methods but only to supplement protection.

11.7.4 *Pre-Use Safety Checks*

Before using any machine or power tool, operators must ensure that it is in good working condition and safe to use. **Do not** assume that tools and machines are in a safe operating condition; inspect them. Check the following:

- All parts are installed and in good condition.
- Cutting blades, bits, sanding discs, etc., are sharp, clean, and in good condition.
- Power cords are undamaged.
- Guards are properly installed.

11.7.5 *Machine and Tool Operating Guidelines*

Operators shall observe the following when operating machines or power tools:

- Do not work alone on machines or perform hazardous operations with a portable power tool without the approval from your supervisor.
- Never leave machine tools operating unattended.
- Do not reach over or around a moving part.
- Always allow a machine or portable tool to come to a complete stop before inspecting it, cleaning it, or making changes (such as changing a cutting bit).
- Keep the area around machines free of clutter.
- Follow the instructions in the operating manual.
- Do not wear loose jewelry, loose badges, gloves, or loose-fitting clothing near moving parts. Roll up loose sleeves, contain long hair, and if appropriate wear coveralls.
- Use caution to avoid injury from sharp cutters, flying chips, or direct contact with moving parts.
- Wear designated PPE. Where there is a potential for flying chips or other particles, wear a face shield and safety glasses.

- Do not eat or drink in a machine operating environment.
- After a job is completed, clean the area and tools, remove all debris and materials, and store all tools properly.

11.7.6 *Inspections, Maintenance, and Testing*

Machines and power tools shall be inspected and tested for safe operation before they are used for the first time, after repairs, and annually.

They must be serviced according to manufacturer's recommendations.

Damaged or defective equipment will be placed “out of service” using lockout/tagout procedures and reported to the supervisor. Equipment will not be placed back in service until it is properly repaired, inspected, and tested.

11.8 Forklifts

OSHA regulation 29 CFR 1910.178, *Powered Industrial Trucks*, contains the requirements relating to fire protection, design, maintenance, and use of fork trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. All OST Powered Industrial Trucks shall be operated and maintained in accordance with this regulation. Forklifts used by OST personnel shall meet the specified design requirements and shall be approved for the intended use.

OST personnel may operate a forklift only after receiving formal training, practical hands-on training, and an evaluation to demonstrate their ability to safely operate the vehicle in the workplace. Training shall be site specific, and will include a discussion of the operating environment, characteristics, capabilities, and limitations of the equipment, operating procedures, and safety procedures.

Managers shall certify, in writing, that each operator has received the required training and that each is capable of safely operating the equipment. Refresher training will be provided at least every 3 years or more often if the work environment, equipment or operating procedures change.

Industrial trucks shall be examined before being placed into service, and shall not be placed into service if the examination shows any condition adversely affecting the safety of the vehicle. Such examinations shall be made at least daily. Where industrial trucks are used on an around-the-clock basis, they shall be examined after each shift. Defects, when found, shall be

immediately reported and corrected. Any powered industrial truck not in a safe operating condition shall be immediately removed from service.

Only authorized persons will make repairs on forklifts. Modifications and additions that affect the capacity and safe operation shall not be performed without the manufacturer's prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. Industrial trucks shall not be altered so that the relative position of the various parts is different from what they were when received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or the elimination of parts (EXCEPTION: conversion from gas to LPG). Additional counter weighting of fork trucks shall not be done unless approved by the manufacturer.

OST's policy for loading safe-secure trailers (SSTs) and safeguard transporters (SGTs) is **not** to use forklifts inside the vehicle. Pallet jacks and other non-powered cargo-handling equipment should be used. The intent of this guidance is to protect the worker and the prevention of damage to the interior of the SST/SGT from forklift collisions.

Deviations/exceptions to the above policy shall be evaluated on a case-by-case basis, and require the written approval of the OST Engineering Branch with coordination through OST ESHB.

11.9 Personal Protective Equipment (PPE)

The requirements for PPE are in OSHA regulation 1910, Subpart I, "Personal Protective Equipment."

PPE, protective clothing, respiratory devices, and protective shields and barriers are used to protect employees when engineering and administrative controls are not adequate to reduce the hazard exposures to permissible levels. Protective equipment can include protection for the eyes, face, head, and extremities.

11.9.1 *Manager Responsibilities*

Managers shall ensure that:

- Workplaces are assessed to determine whether there are hazards present that require the use of PPE. An industrial hygienist should assist with the workplace assessment.
- Protective equipment is provided and used wherever absorption, inhalation, or physical contact with the following may cause injury or impairment:
  - High noise environments.

  - Chemical hazards.
  - Radiological hazards.
  - Mechanical irritants, such as dust.
  - Electrical hazards.
- Employees are informed of and trained to recognize hazards.
- Appropriate PPE is selected to protect individuals from identified hazards, and PPE selections are communicated to employees.
- Employees are fitted with the proper PPE, trained in its use, and informed of the PPE limitations.
- Protective equipment is maintained in a sanitary and reliable condition.
- A notice is posted outside each entrance to a hazardous area where PPE is required to ensure that no unprotected individuals enter.

11.9.2 *Employee Responsibilities*

OST employees who use PPE shall:

- Notify their supervisor **before** performing any work that requires using PPE if they have reason to believe they do not understand how to properly use the equipment.
- Inspect PPE before use and ensure that it is in good condition.
- Wear selected PPE in accordance with training during all operations in which they are exposed to the corresponding identified hazard.
- Notify their supervisor if they are potentially exposed to a hazard that has not been previously assessed for the applicability of PPE.
- Clean PPE after use, store it in a clean place, and if necessary have a qualified person perform maintenance on it.

11.9.3 *Additional Guidance*

OST managers and other personnel should evaluate the following when considering the use of PPE:

- If practical, hazards should be eliminated through engineering controls; if this is not practical, exposures should be reduced through administrative controls. PPE is used only when these other controls are not feasible or practical.
- PPE does not provide unlimited protection and is not a substitute for other hazard controls such as machine guarding, local exhaust ventilation, or other engineering controls. PPE cannot be relied on to provide complete protection all the time, but should be used in conjunction with other controls and safe work practices.

- The use of PPE can induce heat stress on the wearer, and reduce both the field of vision and the ability to hear vocal instructions.
- PPE must meet appropriate standards:
  - Eye and face protection - ANSI Z87.1.
  - Foot protection - ANSI Z41.
- Personnel who are identified to wear a respirator must receive a medical evaluation and be fitted and trained on respirator use.
- Where multiple and simultaneous exposure to various hazards may occur, assessment of PPE should be coordinated with an industrial hygienist.
- Personnel who wear prescription glasses while involved in operations that require eye protection may use prescription safety glasses, eye protection that incorporates prescription in its design, or wear safety goggles over the prescription glasses.
- Eye protection must incorporate side protection where there is a hazard from flying particles or chemical splashes.
- Protective footwear is required when there is a hazard from falling or rolling objects, or objects piercing the sole, and where feet are exposed to electrical hazards.
- Hand protection is required where there is the potential for cuts, abrasions, lacerations, or thermal burns. Impervious gloves are required where there is a potential for skin absorption of harmful substances and chemicals.
- Protective clothing is appropriate when exposed to hazards such as extreme heat or cold, sharp objects, splashes of a harmful liquid, or environmental contamination.
- Material Safety Data Sheets often provide guidance on the use of PPE when handling hazardous materials.
- If there are questions concerning the selection and use of PPE, contact the safety and/or industrial hygiene representative.

11.10 Lockout/Tagout

OSHA regulation 1910.147, *The Control of Hazardous Energy (Lockout/Tagout)*, addresses the requirements for the control of hazardous energy during the servicing or maintenance of machines or equipment in which the "unexpected" energization or startup of the machines or equipment, or release of stored energy, could cause injury to employees.

Managers of individuals who perform maintenance or servicing on a machine or equipment where the unexpected energizing, startup, or release of stored energy could occur and cause injury, shall establish an Energy Control Program. The Program shall consist of energy control procedures, employee training, and annual inspections to verify compliance.

11.11 Control of Suspect and Counterfeit Items (S/CIs)

The Engineering Systems and Technology Division (ESTD) shall monitor a system for the identification and control of suspect and counterfeit items that complies with the requirements in DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*. The management and operating contractors that support OST maintenance activities are responsible for ensuring that S/CIs are not used or introduced into inventories.

11.12 Pressure Safety

The ESTD shall ensure that all pressure systems used in OST operations are designed, fabricated, tested, inspected, maintained, repaired, and operated by trained and qualified personnel.

All pressure vessels, air receivers, and supporting piping systems shall conform to the American Society of Mechanical Engineers (ASME) code, the American National Standards Institute/ASME B.31 Piping Code, or the strictest applicable state and local codes.

When national consensus codes are not applicable, managers shall implement measures to provide equivalent protection and ensure safety equal to or superior to the intent of the ASME code. These measures shall include the following:

- Design drawings, sketches, and calculations shall be reviewed and approved by an independent design professional. Documented organizational peer review is acceptable.
- Qualified personnel shall be used to perform examinations and inspections of materials, in-process fabrications, nondestructive tests, and acceptance tests.
- Documentation, traceability, and accountability shall be maintained for each pressure vessel or system, including descriptions of design, pressure, testing, operation, repair, and maintenance.

11.13 Aviation Safety

The DOE/OST shall ensure that contracts for aviation support contain the requirement that aircraft be operated in accordance with the applicable parts of Title 14, Code of Federal Regulations, *Aeronautics and Space*, and/or equivalent international or military standards that are appropriate to the operation and type of aircraft in service. DOE O 440.2B, *Aviation Management and Safety*, establishes the framework of an efficient, effective, secure, and safe aviation program in the DOE.

11.13.1 *Additional Requirements to Protect Employees*

OST will:

- Conduct baseline noise surveys for all types of aircraft that normally carry passengers.
- Provide hearing protection for ground crews and passengers on aircraft.
- Conduct scheduled radiation protection monitoring of aircraft that are used to transport radioactive materials.
- Ensure that dosimeters are provided to crews and other personnel on flights that require radiation exposure monitoring.
- Ensure that equipment used to service aircraft is appropriate for the task and is in good repair.
- Require that all cargo items are properly documented and certified for air transport.
- Establish cargo tie-down requirements for each type of aircraft and cargo.
- Require that crews and ground personnel report to OST all injuries and all damage to aircraft, equipment, and cargo that occur as part of aviation activities

12.0 INDUSTRIAL HYGIENE

12.1 Background

The purpose of the Industrial Hygiene Program is to reduce the risk of work-related disease or illness. This is accomplished through a systematic process that includes the identification, assessment, and control of chemical, physical, and biological agents and ergonomic stressors. The identification and assessment of these agents and stressors requires the cooperation of management and employees and the assistance of professional industrial hygienists. Minimization of exposures requires engineering controls, where these can be applied, and administrative controls in other cases. Personal protective equipment (PPE) is used to reduce exposures to acceptable levels when controls are not adequate. Training is always required to inform employees of potential exposures, and the protective control measures that are in effect.

12.2 Hazard Communication (HAZCOM) Program

All DOE/OST activities shall comply with the intent and letter of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200, *Hazard Communication*). The guidelines outlined herein are to be applied across all sections and satellite facilities, where applicable.

The OSHA Hazard Communication Standard establishes a comprehensive program of chemical information flowing from the manufacturer, supplier, and importer to the employer and ultimately to the employee using the chemicals. The OSHA standard is intended to cover the health and physical hazards of chemicals found within the workplace. All employees who are exposed, or are potentially exposed, to these chemicals are covered under the OSHA standard and this Program.

The OST has established a comprehensive program of information on chemical hazards to protect employees.

Information concerning hazardous chemicals and substances is provided through a variety of measures. Material Safety Data Sheets (MSDSs), chemical lists, secondary container labels, placards signs, training, and the OST written Hazard Communication Program are all necessary to protect the worker. This information is available to employees within OST. They are instructed to address questions and/or concerns to their supervisor or manager.

This Hazard Communication Program contains specific provisions regarding the MSDS Program, the Secondary Container Labeling Program, and the Information and Training Program. This Program details the information available to employees, where it is located, the system of chemical lists accessible to employees, the means which will inform employees of hazards, and the way the process will be updated.

12.2.1 *Master List of Hazardous Chemicals*

Each site shall develop a master list of the hazardous chemicals and substances known to be present in the workplace. OSHA standard 29 CFR Subpart Z, Toxic and Hazardous Substances, contains lists of known hazardous chemicals.

All new products must have an MSDS and be submitted for review through the procurement process prior to their use. The Site Safety Advisor shall ensure a list of all chemicals used at their site is available to all employees and visitors. The Emergency Management Department will review MSDS for consideration in the Site Hazard Analysis.

12.2.2 *Site Safety Advisor (SSA)*

- To be developed in Chapter 13.

12.2.3 *Material Safety Data Sheets (MSDSs)*

MSDSs shall be obtained for all substances and chemicals found in the work place that are known to pose a health or physical hazard to employees who are exposed or potentially exposed to them. Each MSDS for each substance shall be current and originate at its manufacturer. The Site Safety Advisor shall ensure that copies of relevant MSDSs shall be kept available for employee review in the area in which the chemical(s) are used, stored, or handled.

MSDSs, and an explanation of the information they contain (Attachment 12A), shall be the subject of extensive portions of the Education and Training Program. This information shall be filed in each applicable area as stated above to facilitate employee review and access.

Documentation from the manufacturer or supplier that a chemical is not hazardous pursuant to the definitions set forth in the OSHA Standard 29 CFR 1910.1200, *Hazard Communication*, will be equal to the receipt of such MSDS.

12.2.4 *MSDS Updating System*

The Site Safety Advisor will ensure that all chemicals purchased will be subject to an MSDS request and updating system. The Site Safety Advisor shall review all incoming MSDSs. All incoming hazardous chemicals must be accompanied with an up-to-date MSDS from the chemical manufacturer. The Site Safety Advisor shall initiate a request for MSDSs in the event any chemicals are received for which no current MSDS is on file.

12.2.5 *Container Labeling Program*

Each container of incoming hazardous chemicals must be labeled, tagged, or marked to indicate the product name (as seen on the OST Master List of Hazardous Chemicals and the MSDS), manufacturer's name and address, and any hazard warnings for the chemical. With regard to the assurance that incoming chemicals will be properly labeled, OST's policy is that labels on incoming chemicals will not be removed or defaced unless they are immediately replaced with new labels containing all required information consistent with the associated MSDS. Moreover, transfer containers, other than immediate use containers (defined below), will be labeled with the product name and the appropriate hazard warning found on the original container.

The hazard warning may be either in written or pictorial format, sufficient to convey the hazard associated with that particular product. Words, pictures, or symbols that convey the appropriate hazards of the chemical or substance shall be deemed sufficient. In all cases, the relevant label shall bear the proper product name from the MSDS for permitting appropriate cross-referencing by the employee from the label to the MSDS. The following exemptions shall be permitted:

- A portable container in which hazardous chemicals are transferred from properly labeled containers need not be labeled, provided it is intended for the immediate use of the employee who performs the transfer and is for his/her use only during that particular work day shift.
- Signs, placards, and the like may be used to convey the product name and hazard information for specific circumstances where there are a number of containers all carrying the same contents, all with the same hazard.

12.2.6 *Employee Access to Information*

Employees will be informed of, and will have access to, all relevant information, including this document and the OSHA standard itself, which can be found in their work area, in their Site Safety Advisor's office. Relevant copies of particular MSDSs shall be made available to

employees in each area where such chemicals are used, stored, or handled, and where employees may be, or actually are, exposed in the normal course of daily activities.

12.2.7 *Employee Education and Training*

The OST shall provide its employees with education and training on the hazardous chemicals and substances found in their work area at the time of their initial assignment, and whenever a new health or physical hazard is introduced into their work area.

Employees shall be informed of the following:

- The requirements of the OSHA standard.
- Any operations in the work areas where hazardous chemical are present.
- The location and availability of the written Hazard Communication Program, including the required list(s) of hazardous chemicals, and most importantly, MSDSs.

Employee training shall include, as a minimum, the following:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the OST, continuous monitoring devices, and the visual appearance or odor of hazardous chemicals when being released).
- Physical and health hazards of the chemicals in the work area.
- Measures employees can take to protect themselves from these hazards, including specific procedures the OST has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and PPE to be used.
- Details of the OST's Hazard Communication Program, including an explanation of the OST's container labeling requirements.

12.2.8 *Non-Routine Tasks/Hazards Training*

It is the policy of the OST that tasks that are out of the ordinary and are not part of the day-to-day routine are **not** to be undertaken until after receiving specific training from their particular supervisor or designee in the hazards associated with the non-routine task.

12.2.9 *Hazardous Chemical Warnings for Contractors and Visitors*

It is the policy of the OST to adequately apprise contractors and visitors of the hazardous substances to which their employees may be exposed when they are present in the OST

facilities. Contractor personnel and visitors who may be exposed to hazardous chemical substances in OST facilities will be given access to MSDSs for each hazardous chemical and provided the proper PPE. OST employees shall receive site-specific HAZCOM briefings if they are or may be exposed to or potentially exposed to chemical hazards at sites other than those belonging to OST.

12.3 Lead Testing Program

12.3.1 *Hazards*

When absorbed into the body in large doses, lead is a toxic substance. Lead can be absorbed through inhalation of airborne particles, ingestion by mouth, or absorbed through the skin. Lead as used in this Program means elemental (metallic) lead, all inorganic lead compounds, and organic lead soaps. Within DOE/OST, the primary area for lead exposure is at the live-fire ranges, where lead particles can become airborne as lead bullets are fired, and from lead compounds in some primers and explosive devices. The purpose of this Program is to provide the requirement to monitor the levels of lead exposure in order to ensure that personnel are not exposed above allowable limits.

12.3.2 *Monitoring and Surveillance Requirements*

The requirements to monitor work places for lead exposure levels and to provide surveillance for employees that are exposed to elevated levels of lead are contained in OSHA Standard 29 CFR Part 1910.1025, *Lead*. The OST Lead Testing Program is designed to comply with this standard. The OSHA standard establishes two thresholds for lead exposure:

- The first threshold is the **Action Level**. This is employee exposure, without regard to use of respirators, to an airborne concentration of 30 micrograms of lead per cubic meter of air (30 $\mu g/m^3$) averaged over an 8-hour period. If monitoring shows that airborne lead levels are below the action level, no actions are required.
- The second threshold is the **Permissible Exposure Level (PEL)** that is set at 50 micrograms per cubic meter of air (50 $\mu g/m^3$) averaged over an 8-hour period. Employees are not to be exposed to airborne lead levels greater than the PEL.

A professional industrial hygienist using strict protocols (i.e., NIOSH Method 7300) shall conduct monitoring for airborne lead. OSHA requirements also state that the airborne monitoring and analysis shall have an accuracy of not less than plus or minus 20% for airborne concentrations of lead equal to or greater than 30 $\mu g/m^3$. Airborne monitoring shall be conducted at least annually. An effort shall be made to conduct the monitoring at different seasonal times (i.e., spring, fall, etc) of the year.

If monitoring results indicate exposure levels above the PEL, actions will be taken to reduce the exposure to employees below the PEL. Additional monitoring will be conducted quarterly until exposures are below the action level on two tests taken at least 7 days apart.

If monitoring results indicate exposure levels above the action level, but below the PEL, additional tests shall be conducted every 6 months until the exposure levels for two consecutive tests taken at least 7 days apart are below the action level. Medical surveillance shall be provided for individuals who are exposed to airborne lead levels above the action level for 30 days per year.

If results indicate exposures are below the action level, no further actions are required other than training on minimizing lead exposure.

For live-fire ranges that are used by other DOE elements or contractors, the results of tests they conduct for airborne lead levels may be used to satisfy the requirement for an annual test, if the process is the same, i.e., same course of fire, same guns, and same ammo, as long as a copy of the results are obtained by OST and kept on file. The test results shall be provided to management and will be made available to all employees within 5 days after they are known.

Firearms Instructor Certified Personnel shall be tested for blood lead levels annually. If or when blood lead testing indicates that personnel may be exposed to lead levels near or above the action level for more than 30 days per year, semi-annual testing will be conducted.

OSHA Standard 1910.1025 contains detailed requirements on procedures to follow for individuals whose blood lead levels exceed 40 μg/100 g of blood.

12.3.3 *Training*

Initial training shall be provided to all personnel who may be exposed to lead as part of their duties. This training shall include:

- The potential adverse effects of lead exposure with particular reproductive effect on both males and females.
- The areas where exposure to lead may be expected.
- The purpose and results of monitoring for airborne lead.
- The purpose of medical surveillance and provisions for medical removal.
- Engineering and administrative controls in use to reduce exposures.
- Access to information on lead, training materials, and the OSHA standard on lead.

- Instructions that chelating agents should not be used routinely to remove lead from their bodies and should not be used except under the direction of a physician.
- The need to follow good personal hygiene practices.
- The requirement for employees to notify their supervisor if they develop symptoms associated with lead poisoning or if they desire additional information concerning the effects of lead.

12.3.4 *Personal Hygiene Practices*

The absorption of lead can be reduced through the use of good personal hygiene habits. Employees shall comply with the following:

- Do not eat or smoke in any area where exposure to lead is possible.
- Avoid oral contact with anything that is contaminated with lead.
- Wash hands before eating or smoking after being exposed to lead.
- Use protective gloves when cleaning equipment that is lead contaminated.

12.4 Respiratory Protection

As far as feasible, managers will implement engineering controls to prevent occupational disease caused by breathing air contaminated with potentially harmful dusts, fumes, sprays, mists, fog, vapors, or gases. If effective engineering controls are not feasible, personnel shall use appropriate respirators to reduce exposures. Within OST, the primary people that require the use of respirators are the Federal Agents and those that are identified to serve on emergency response teams. .

The OST Respiratory Protection Program reflects the current standards of OSHA Standard, 29 CFR 1910.134, *Respiratory Protection* and ANSI Z88.2, *American National Standard for Respiratory Protection.* The elements of the OST Respiratory Protection Program include the following:

- Written program – The Program is jointly maintained by the Human Reliability and Resources Branch (HRRB) and the Environment, Safety and Health Branch.
- Hazard assessment – Prior to the issuance of respiratory protection, a hazard assessment of the proposed operation or activity is required by OSHA standards.
- Medical evaluation – A medical questionnaire and examination is required (Appendix C to 1910.134).
- Training – All those wearing respiratory protection will be trained in the respiratory hazards to which they may be potentially exposed during routine and emergency situations. Also,

the training will include the proper use of respirators, including putting on and removing them including any limitations on their use and maintenance.

- Maintenance – Procedures and schedules are established for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
- Respirator selection – All respirators will be NIOSH-approved or approved under the appropriate MIL standard.
- Fit testing – A quantitative fit test is conducted annually (more often as required by facial changes) as required in Appendix A to 1910.134.
- Program evaluation - An evaluation of the OST Respiratory Protection Program is conduced annually to ensure that the Program is being properly implemented and to consult employees to ensure that they are properly using the respirators.

12.5 Hearing Conservation Program

Some OST activities, such as those at the live-fire range and security exercises, can expose participants and observers to high noise levels that could cause temporary or permanent hearing loss. The provisions of this Program, defined in OST policy (see ES&H Policy 7.02), are designed to prevent hearing damage and to comply with the requirements of OSHA Standard, 29 CFR 1910.95, *Occupational Noise Exposure*.

12.5.1 *Requirements*

Managers of areas or work activities that are known or are reported as having the potential for high noise levels (e.g., voices have to be raised to be heard from a distance of 3 feet) shall request that the supporting industrial hygiene professional conduct a noise level evaluation.

If the 8 hour time-weighted, average noise exposure equals or exceeds 85 decibels, personnel working in that area will be entered into the Hearing Conservation Program.

If the noise exposure exceeds 90 decibels (db), feasible engineering or administrative controls shall be instituted to reduce the exposure level to 90 db or lower. If controls are not effective in reducing the noise level, hearing protection shall be provided to reduce the noise level to 90 decibels or below.

Individual employees will report to their supervisor or manager areas of concern because of high noise levels and will wear hearing protective devices as instructed.

The Site Occupational Medical Director (FOH) is the Hearing Conservation Program Officer (HCPO) for OST. The HCPO will review hearing loss evaluation reports and provide the final determination of these cases (see ES&H Policy 7.02).

12.5.2 *Training*

The SSEMD will provide annual training to employees and supervisors who are in the Hearing Conservation Program; the Section Training Specialist may conduct or assist. Records of this training shall be maintained in the individual's training records. Training will address the effects of high noise exposure, identify high noise areas, explain engineering or administrative control measures that are in place to reduce exposure, and provide instruction on the use of hearing protective devices.

12.5.3 *Audiometric Testing*

Audiometric testing is completed for individuals who are entered into the Hearing Conservation Program (see ES&H Policy 7.02). Test results are recorded on the appropriate OST forms that are then sent to the HCPO.

Audiometric testing shall be performed by a licensed or certified audiologist, ortolaryngologist, or other physician, or by a certified technician. The test will include a pure-tone examination of 500, 1,000, 2,000, 3,000, 4000, and 6,000 hertz (Hz) and will be taken separately for each ear. For each test, the employee will complete OST Form HCP.01.

An audiometric test is conducted at the time of employment, usually during the initial physical exam to establish a valid reference (baseline). Results (audiogram) are recorded on the OST Form HCP.02. This test to establish a baseline shall be preceded by at least 14 hours without exposure to workplace or high levels of non-occupational noise.

An annual audiometric test is conducted, normally at the time of the yearly physical. It does not require a noise-free environment before being conducted. Results are recorded on the OST Form HCP.03 and forwarded to the HCPO within 20 days. An employee, who has a Standard Threshold Shift of 10 db or more at 2000, 3000, and 4000Hz in either ear, will be notified that additional testing is required, and this will be conducted as soon as possible.

Results of the follow-up audiometric test will be entered on the OST Form HCP.04 that is forwarded to the HCPO within 20 days. If the tests show a return to normal levels, no further action is required. If the threshold shift persists, the employee will be notified and scheduled for an audiometric center evaluation.

12.5.4 *Audiometric Center Evaluation*

A comprehensive evaluation at an audiometric center that deals with hearing losses and their treatment shall be completed as follows:

An assessment that will include:

- Otoscopy - A visual inspection of the ear canal to determine the presence of excessive cerumen, foreign body, collapsing canal, drainage, etc.
- Pure-Tone Threshold Measurement - Air conduction and bone conduction testing to determine degree and type of hearing loss.
- Speech Reception Thresholds - To verify pure-tone findings.
- Speech Discrimination Testing - Done to assess intelligibility of speech signal.
- Diagnosis to include type of hearing loss.
- Consultation to the employee in the use of hearing protection for on and off the job, consequences of hearing loss, and prevention of further loss.
- Recommendation - For example, baseline change, medical follow-up, etc.

A written evaluation shall be provided within 10 days on the OST HCP.05 to the HCPO for review and final determination. If the HCPO determines that a permanent threshold shift of 10 db or greater has occurred in either ear due to occupational noise exposure, the SSEMD will comply with OSHA and DOE reporting requirements. The employee's manager will provide additional training on noise exposure and, if necessary, will provide hearing protection with an increased noise reduction rating. The manager shall ensure that the employee is not exposed to occupational noise exceeding 85 db.

12.5.5 *Ear, Nose, and Throat Examination*

If an ear, nose, or throat problem is identified or suspected for an individual on the Hearing Conservation Program, that individual shall be referred to his personal physician for an examination. The physician will be asked to record the results of the examination on the OST Form HCP.06 and to forward it to the HCPO within 20 days.

ATTACHMENT 12A: ALL ABOUT THE MATERIAL SAFETY DATA SHEET (MSDS)

The MSDS is a written document, usually prepared by the manufacturer of a product, which identifies the chemicals that make up the product. It contains information on the hazardous chemical and physical properties, the health effects from overexposure, routes of exposure, precautions for safe handling [personal protective equipment (PPE)], and emergency and first aid procedures. The MSDS is the central document for transmitting detailed hazard information.

The following information outlines all sections of the MSDS, as well as a brief synopsis of the information therein.

Section I - Identification

This section identifies the product, according to the label name, and any other common names used for that product. It also identifies the manufacturer, and the manufacturer's address and phone number where additional information can be obtained in the event of an emergency.

Section II - Hazardous Ingredients

If the product mixture and/or any of its component ingredients are hazardous, the chemical and common name of these ingredients must be listed with their permissible exposure limits (PELs). The PEL is the concentration in air which workers can be repeatedly exposed day after day without any adverse health effects. The PEL has been established from industrial experience and toxicological tests. The levels of contaminants in the workplace can be measured and compared with the PEL to determine whether a health hazard exists.

Section III - Physical/Chemical Characteristics

Physical and chemical properties of a product are important in evaluating the hazards.

- Boiling Point - This value refers to the temperature at which a liquid boils. Water boils at 212 degrees Fahrenheit (°F) (100 degrees Celsius [°C]) at sea level. Materials with low boiling points tend to evaporate quickly and may give off considerable amounts of toxic and/or flammable gases. Materials with higher boiling points are less apt to off-gas unless heated. Low boiling-point materials in closed containers will build up pressure when exposed to heat and can explode.

- Vapor Pressure - This value refers to the pressure exerted by the escaping gas or vapor from the surface of a liquid. The vapor pressure of a liquid will also vary with temperature. At the boiling point of the material, the vapor pressure equals the local atmospheric pressure. Materials with low vapor pressures evaporate slowly, while those with high vapor pressure evaporate quickly and have a greater potential to give off toxic or flammable gases.
- Vapor Density - This value refers to the weight of a vapor or gas relative to the weight of air. It gives an indication of where an escaping gas or vapor will accumulate. Materials with vapor densities greater than one (1) will tend to accumulate on the floor and become a hazard to the worker. Those materials with vapor densities less than one (1) will rise toward the ceiling.
- Solubility in Water - This value refers to the amount of a chemical that can be dissolved in water. This value, along with the specific gravity value, is important when evaluating the fire extinguishing media required.
- Specific Gravity - This value refers to how heavy a materiel is in relation to water. A material with a specific gravity less than one (1) will float on water. A hazardous example is oil, which has a specific gravity less than one (1). If one uses a water-based fire extinguisher on an oil fire, the fire will be scattered around, possibly creating a greater hazard. A material with a specific gravity greater than one (1) is heavier than water and will sink.
- Melting Point - This value refers to the temperature at which a solid turns into a liquid. This value provides information on the various methods by which the product can be dispersed into the air if subjected to the melting point temperature.
- Evaporation Rate - This value refers to the time it takes a liquid to be converted into its vapor at a given temperature. This value is referenced relative to ether or butyl acetate. Materials with low rates evaporate quickly, becoming a potential inhalation hazard. Materials with high evaporation rates take more time.

Section IV - Fire and Explosion Data

This section provides information on the fire and explosion hazards of the product, as well as any appropriate fire extinguishing equipment needed.

- Flash Point - This value refers to the temperature at which liquid will give off enough flammable vapors to produce a flame when a source of ignition (spark or flame) is present. Liquids with flash points below 100°F are especially hazardous, since they give off vapors at room temperature that can be ignited by sparks or static electricity. Smoking, open-flames, or high-temperature sources should never be permitted near flammable or combustible liquids.

  - Combustible - A liquid having a flash point above 100°F.
  - Flammable - A liquid having a flash point below 100°F.
  - Flammable Limits - The range at which vapors will burn or explode.
  - Lower Explosive Limit (LEL) - This value refers to the concentration of a vapor in air below which ignition will not occur.
  - Upper Explosive Limit (UEL) - This value refers to the concentration of a vapor in air above which ignition will occur.
  - Extinguishing Media - This information describes the type of firefighting media suitable for use on that burning material (i.e., water, halon, CO_2, foam, etc.). There are three categories of fire extinguishers.
    - Type A - Is for ordinary combustibles such as wood, paper, and cloth.
    - Type B - Is for use on flammable liquids and grease such as gasoline, paints, and oils.
    - Type C - Is for use on energized electrical equipment such as motors, switches, and fuse boxes.
    - Type D - Is for use on combustible metals such as magnesium, titanium, sodium, lithium, etc.
- Special Firefighting Procedures - Describes any special precautions that are required for firefighting such as PPE, how close to approach the fire, and explosion hazards. This information is especially useful for the local fire department.

Section V - Reactivity Data

Under certain conditions, some materials can be unstable or can be incompatible when they come in contact with other chemicals. When two incompatible materials come in contact, they may react and release large amounts of energy, possible causing an explosion. This section will describe the conditions and materials, if any, to avoid.

Section VI - Health Hazard Data

This section describes recognized health hazards and symptoms due to chronic (long-term) and acute (short-term) overexposures to a material. It includes information on how the material would enter your body:

- Inhalation (air).
- Skin absorption.
- Ingestion (mouth).

If any of the ingredients are known to be carcinogens (cancer-causing) or potential carcinogens, and comprise greater than 0.1 percent of the material, this information must be noted. References to any toxicological studies might be noted as well.

- Medical Condition - The information will describe any medical condition a person may have which could be aggravated by exposure to the product.
- Emergency and First Aid Procedures - If a person is overexposed to the material, this information will describe the emergency procedures and first aid to administer until professional medical help arrives.

Section VII - Precautions for Safe Handling and Use

This section describes the following:

- Accidental Spills, Releases, or Leaks - This information describes the precautionary measures to be taken, and the appropriate cleanup and disposal procedures.
- Handling and Storage - Precautionary information concerning handling, storage, etc., if not mentioned in previous sections, is covered.

Section VIII - Control Measures

This information describes the types of PPE, ventilation, and other controls needed when working with the material (gloves, face shields, clothing, respirators, etc.). Generally speaking, the protective equipment and controls recommended by the manufacturer in the MSDS usually apply to the most hazardous condition of use. It is permissible to contact the manufacturer to discuss the control measures and/or PPE required for a less hazardous condition conducted in your workplace.

13.0 SITE SAFETY ADVISOR

To be developed

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14.0 MEDICAL AND PHYSICAL FITNESS PROGRAMS

14.1 Background

The purposes (see FA Policy 4.05) of the medical and physical fitness programs are to promote the physical well being of federal agents and reduce their risk of work-related disease or illness due to physical and medical factors (see annex). This is accomplished through a systematic process that includes an assessment of each agent's medical condition and physical performance and an individually tailored prescription for physical exercise. Agents are encouraged to participate in job-sanctioned physical fitness activities when their duties permit. An incentive program promotes a higher level of physical fitness than the minimum requirements.

14.2 Medical Organization

The OST has contracted with Federal Occupational Health (FOH), a part of the Department of Health and Human Services, to provide the OST Medical Program. The FOH provides OST with a Medical Director (the Site Occupational Medical Director), nine site physicians, five exercise physiologists, a program coordinator and an Albuquerque health unit secretary. Each of the OST Federal Agent Facilities and the training facility at Fort Chaffee has a site physician and an exercise physiologist. The FOH also provides consultants in various medical specialties, as needed.

14.3 Medical Services

Managers shall ensure that employees have medical personnel available for advice and consultation on matters involving on-the-job exposures and hazards. In areas where access to an infirmary, clinic, or hospital is not readily available for treatment of injured employees, a person or persons shall be trained and readily available to provide first-aid treatment. Adequate medical supplies shall be readily available.

All firearms instructors shall be trained in cardiopulmonary resuscitation (CPR), Automated External Defibrillators (AED) and in first-aid, and shall be retrained annually. Instructors certified by the American Red Cross or the American Heart Association shall administer the CPR/first-aid training. An approved plan is required for handling, treating, and evacuating injured personnel through the use of air ambulance, on-scene wheeled ambulance, and the like.

14.4 Medical Issues

14.4.1 *Purpose*

The OST medical and physical fitness programs are designed to ensure that each Federal Agent receives, every six months, either a medical examination by a physician or a physical fitness assessment by an exercise physiologist (EP). Physical performance tests are scheduled approximately in the middle of each six-month period.

14.4.2 *Schedule*

OST policy (see FA Policy 4.04), Employment Requirements for Federal Agents, requires all Federal Agents to pass a Physical Performance Test consisting of a one-mile run with a maximum qualifying time of 8 minutes 30 seconds and a 40-yard prone-to-running dash with a maximum qualifying time of 8.0 seconds. The Physical Performance Test must be passed twice per year. FA Policy 4.04 also defines a core week during which a Federal Agent receives an annual medical examination by a physician. The annual schedule is as follows:

- 2-1/2 months after the core week, the first 45-day Physical Performance Test period begins.
- Between 5-1/2 months and 6-1/2 months after the core week, the agent receives a full Physical Fitness Assessment by an Exercise Physiologist per OST FA Policy 4.05.
- 8-1/2 months after the core week the second 45-day Physical Performance Test period begins.

14.5 Physical Fitness Assessment, Exercise Prescription, and Incentive Program

14.5.1 *Physical Fitness Assessment*

Every agent receives an annual full physical fitness assessment from an Exercise Physiologist per OST FA Policy 4.05. The assessment involves the measurement of resting heart rate, resting blood pressure, weight, height, body mass index, waist and hip circumference, and body composition. Maximal aerobic power is estimated through the use of a treadmill and exercise protocol. Upper and lower body strength is measured.

14.5.2 *Exercise Prescription*

The Exercise Physiologist writes an exercise prescription for the agent based on the results of the assessment and the needs and desires of the agent to obtain a particular level of total body fitness.

14.5.3 *Incentive Program*

The Incentive Program offers each agent the possibility of receiving paid time off as a reward for exceptional physical performance. This program is open to agents who receive a MET value of 12.0 METS for the cardiovascular component of the physical fitness assessment. (One MET is defined as 3.5 milliliters of oxygen consumption per kilogram of body weight per minute.) The agent is tested in push-ups, sit-ups, bench press, leg press, flexibility (sit and reach), and body composition. The raw scores are weighted according to OST FA Policy 4.05, Section IV, and converted to "Incentive Units". Each Incentive Unit translates into two hours of paid time off. An agent may receive a maximum of two days of paid time off per year.

14.6 Job-Sanctioned Physical Fitness Program

14.6.1 *Purpose*

OST policy (see FA Policy 4.06) establishes job-sanctioned physical fitness activities for federal agents while they are on post at their duty station and during rest overnight status. The policy also establishes procedures for activities allowed outside of normal duty hours and away from the duty station.

14.6.2 *Risk Assessment*

Prior to participation in a sanction physical fitness activity, each agent is required to read and sign the activity specific assessment. The agent's signature acknowledges his understanding of the content of the document. All protective equipment specified in the risk assessment must be worn while participating in the activity.

14.6.3 *Injuries*

If an employee is injured during off duty hours/off-site, an on-the job injury claim (CA-1, Notice of Traumatic Injury) may be filed with the U.S. Department of Labor. The supervisor must be able to verify that the employee was injured while performing authorized exercises under the Physical fitness Program.

OST policy (see FA Policy 4.07) establishes a Physical Fitness Rehabilitation Program. Entry into the Program is mandatory for an agent who fails the Physical Performance Test. An agent may also enter the program for reasons other than test failure, such as weight loss, high blood sugar, high blood pressure, stress management, and/or physician recommendation. The Exercise Physiologist will design a rehabilitation program that is tailored to the needs of the individual agent.

15.0 CRITERIA FOR INCLEMENT WEATHER AND OTHER NATURAL PHENOMENA HAZARDS

15.1 Introduction

Training is a very important aspect of the OST Federal Agent mission. The rigorous physical activities involved during Operational Readiness Training (ORT), Sustainment Training, Agent Candidate Training (ACT), and Joint Training Exercises (JTX), as well as live-fire training and physical fitness training, require constant vigilance, concentration, and perseverance by all parties to ensure the accomplishment of the training mission. Safety and health are vital aspects of federal agent training. To ensure a safe training, the following environmental factors must be taken into account prior to and during field training activities.

If other environmental training guidelines exist for a particular site or activity, the more restrictive guidelines will be utilized.

15.2 Purpose

The following are guidelines for federal agent training during inclement weather and natural phenomena hazards. Many hazards exist when training is conducted during periods of extreme heat and humidity, or during periods of exceptional cold weather. Fog, dust, sleet, high winds, snowfall, or rainfall can impair a trainee's vision, footing, and ability to manipulate a weapon, or otherwise degrade the training environment so as to create potential safety hazards to both the trainee and those around him. Tornados, earthquakes, and lightning can pose direct and potentially fatal consequences if adequate precautions are not taken.

15.3 Responsibilities

The Course Manager, Training Specialist, or Safety Manager is authorized to postpone, or cancel, any performance-based training/qualification activity that he believes to be unsafe or exceeding the approved criteria for inclement weather.

The Course Manager/Training Specialist/Safety Manager is directly responsible to point out and correct all unsafe training activities, or to halt training if appropriate. The following criteria are established to assist the Course Manager/Training Specialist/Safety Manager in determining when the training environment is unacceptable. Since much of the information below is subjective in nature, Course Managers/Training Specialists/Safety Managers must take great care in evaluating both individuals being trained and the prevailing conditions under which they are being trained prior to making a final determination.

All training staff members, support members, or participants are responsible for pointing out any unsafe, or potentially unsafe, condition or conditions that may impact training safety.

15.4 Conditions

The following factors will be taken into account to determine when training activities for ORT, ACT, JTX, Sustainment, weapon qualification/training, or physical fitness training/qualification are to be postponed or canceled.

1. WET. All training/qualification activities shall cease when precipitation is such that is adversely affects operation of firearms, interferes with stability of footing, impairs ability to manipulate weapons and see targets, or adversely affects road surfaces/driving tracks. Heavy rains can cause local flooding in training areas and raise water levels of streams and creeks to dangerous depths, and disguise deep holes and other underwater hazards. Training areas should be surveyed prior to initiating training events to ensure no water hazards are present. Trainees should be cautioned against attempting to ford any water barrier unless they have the permission of their Controller. Hail, sleet, or ice storms are especially hazardous to outdoor training operations, and training should be suspended when these conditions arise.

2. COLD. The chill indices (see attachments 14A and 14B) shall be used to determine when activities shall be suspended for live fire training and activities other than live fire training respectively. For example, at 30 degrees Fahrenheit and with a wind speed of 29 miles per hour, all live-fire activities will be suspended.
   (**Note:** Course Managers/Training Specialists will ensure ample supplies of water and/or athletic beverages are readily available to trainees during all cold and hot weather training to ensure replacement of their lost body fluids.)

3. HEAT. The Wet Bulb Globe Temperature (WBGT) Index shall be used to determine when conditions are such that all outdoor training and qualification activities must be terminated. The WBGT Temperature Chart and definitions (see Attachment 14C) shall be used in making this determination. Since the Federal Agent Facilities are located in different areas of the country, it cannot be assumed that they are all equally acclimated to an extremely hot, humid climate such as exists at the OST Transportation Safeguards Training Center at Fort Chaffee, Arkansas, during summer months. Therefore, Course Managers, Training Specialists, and Safety Managers are responsible to evaluate the level of work against the WBGT Index to determine if the activity should be limited or suspended/terminated (see Work/Rest/Water Consumption Table, Attachment 14C).
   (**Note:** Course Managers/Training Specialists will ensure ample supplies of water and/or athletic beverages are readily available to trainees during all cold and hot weather training to ensure replacement of their lost body fluids.)

4. OBSCURE CONDITIONS. All outside activities shall cease when conditions such as blowing dust, sleet, rain, snow, hail or fog obstruct the ability of the trainees to see clearly or to traverse terrain safely, or handle their weapons, equipment or vehicles in a safe manner.

5. LIGHTNING. All activities shall be postponed when any lightning strikes within five (5) miles of a training location. Where available, Lightning Detection Systems (LDS) shall be used to determine if outside training should be postponed. If a LDS is not in use, or if training is being conducted in a remote location where no lightning detection exists, the Course Manager/Training Specialist/Safety Manager shall count seconds between the lightning discharge flash and the audible report (thunder). When estimating distance, use the rate of five (5) seconds per mile, e.g., if the count is twenty-five (25), the lightning is considered in the immediate vicinity (5 miles) and all outdoor training will be terminated.

   IF OUTDOORS... *Avoid water. Avoid the high ground. Avoid open spaces.* Avoid all metal objects including electric wires, fences, machinery, motors, power tools, etc. Unsafe places include underneath canopies, small picnic or rain shelters, or near trees. Where possible, find shelter in a substantial building or in a fully enclosed metal vehicle such as a car, truck or a van with the windows completely shut. If lightning is striking nearby when you are outside, you should:

   A. ***Crouch down****.* Put feet together. Rest on balls of feet (this limits the surface area of footprint touching the ground). Place hands over ears to minimize hearing damage from thunder.
   B. ***Avoid proximity*** (minimum of 15 ft.) to other people.

   IF INDOORS... *Avoid water. Stay away from doors and windows. Do not use the telephone. Take off head sets.* Turn off, unplug, and stay away from appliances, computers, power tools, & TV sets. Lightning may strike exterior electric and phone lines, inducing shocks to inside equipment.

   When a weather front is no longer a factor and when lightning is no longer in the immediate vicinity, training may be resumed. The ECC can verify that the weather front has left the training area by monitoring the National Weather Service broadcasts and/or local weather reports.

6. TORNADO. From Albuquerque to Oak Ridge, OST training and Agent operating venues are within the geographic section of the United States referred to as “Tornado Alley.” At any time, but particularly during February to June, tornados can strike. Tornados or tornadic winds can accompany severe thunderstorms and can appear with little or no

warning. In this respect, the Course Manager/Training Specialist/Safety Manager must be constantly vigilant for severe weather fronts that can spawn these high energy phenomena.

The onset of a tornado is marked by:

- A sickly greenish or greenish black color to the sky
- If there is a watch or warning posted, then the fall of hail should be considered as a real danger sign.
- A strange quiet that occurs within or shortly after the thunderstorm
- Clouds moving very fast, especially in a rotating pattern or converging toward one area of the sky
- A sound a little like a waterfall or rushing air at first, but turning into a roar as it comes closer. The sound of a tornado has been likened to both railroad trains and jets.
- Debris dropping from the sky.
- An obvious “funnel-shaped” cloud that is rotating, or debris such as branches or leaves being pulled upwards, even if no funnel cloud is visible.

If a tornado is spotted and it appears to be stationary, it may be moving toward the observer! In the event of a tornado or observed tornadic activity, all training should be terminated and the following “take cover” actions initiated:

<u>If in a building</u>:

- Take cover in the basement, away from the west and south walls
- Find a small windowless, first floor, interior room or hallway
- Stay away from windows and doors

<u>If outdoors with no shelter nearby</u>:

- Seek a clear depressed area away from potentially falling trees, power lines, and lightning. Lie flat in a ditch or low-lying area.
- A culvert in a ditch may be good choice if there is no rain. BUT, if there is rain, flash flooding may be more dangerous and likely than the tornado.

<u>If in a vehicle</u>:

- Leave the vehicle and take shelter as above
- DO NOT seek shelter under an underpass – head for a ditch

7. EARTHQUAKE: Because OST conducts specialized training exercises at venues throughout the United States, the potential for seismic activity exists. Since no advanced warning is anticipated, only actions in response to earthquake tremors and aftershocks are appropriate. At the onset of ground motion or vibrations, all training exercises should be terminated.

   DURING If indoors:

   - Take cover under a piece of heavy furniture or against an inside wall and hold on.
   - Stay inside.
   - The most dangerous thing to do during the shaking of an earthquake is to try to leave the building because objects can fall on you.

   If outdoors:

   - Move into the open, away from buildings, street lights, and utility wires.
   - Once in the open, stay there until the shaking stops.

   If in a moving vehicle:

   - Stop quickly and stay in the vehicle.
   - Move to a clear area away from buildings, trees, overpasses, or utility wires.
   - Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.

   AFTER be prepared for aftershocks.

   Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.

ATTACHMENT 15A: LIVE-FIRE ACTIVITY

CHILL INDEX

TO BE USED TO DETERMINE WHEN LIVE FIRE ACTIVITY IS TO BE POSTPONED

Wind Speed MPH	Actual Temperature in Degrees (Fahrenheit)											
	50	**40**	**30**	**20**	**10**	**0**	**-10**	**-20**	**-30**	**-40**	**-50**	**-60**
	Equivalent Temperature in Degrees (Fahrenheit)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-15	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

Live fire activities are permissible at the discretion * of the Training Instructor

No Live Fire Activities Permitted

*** The Training Instructor is to take into account other climate conditions such as precipitation, fog, lightning, etc.**

ATTACHMENT 15B: OTHER THAN LIVE-FIRE ACTIVITIES

CHILL INDEX

TO BE USED TO DETERMINE WHEN TRAINING (OTHER THAN LIVE FIRE) ACTIVITY IS TO BE POSTPONED

Wind Speed MPH	Actual Temperature in Degrees (Fahrenheit)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Temperature in Degrees (Fahrenheit)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-15	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

Activities are permissible at the discretion * of the Training Instructor

No Activity Permitted

*** The Training Instructor is to take into account other climate conditions such as precipitation, fog, lightning, etc.**

HYPOTHERMIA

Symptoms	First Aid
Confusion, bizarre behavior, withdrawal from group interaction May become unconscious with nearly undetectable breathing and pulse	This is a Medical Emergency. Evacuate to medical care facility. Prevent further cold exposure. Remove wet clothing. Warm by covering with blankets.

FROSTBITE

Symptoms	First Aid
Skin becomes numb, turns gray or waxy white in color; Is cold to touch and may feel stiff.	Prevent further cold exposure Remove wet clothing Warm by covering with blankets Evacuate to medical care facility

ATTACHMENT 15C: WBGT INDICES ALL OUTSIDE ACTIVITIES

Category	WBGT Index	Non-acclimated	Acclimated
I	78 – 81.9	Monitor personnel and enforce water intake. Caution should be taken.	Normal duties.
II	82 – 84.9	Use discretion in planning intense physical activity. Limited intensity of work and exposure to sun. Provide constant supervision.	Normal duties.
III	85 – 87.9	Strenuous exercises such as physical training will be canceled. Outdoor classes in the sun will be canceled.	Use discretion in planning intense physical activity. Limit intensity of work and exposure to the sun. Provide constant supervision.
IV	88 – 89.9	ALL physical training and strenuous activities will be canceled.	Strenuous outdoor activities will be minimized for all personnel with less than 12 weeks training in hot weather. Thoroughly acclimated personnel can carry on limited activity for periods not exceeding 6 hours a day.
V	90 and above	Strenuous activity and non-essential duty should be canceled for ALL personnel.	

CLASSES OF ACTIVITIES

Light Activities: Classroom activity, motorized movement, administrative work, and occasional walking

Moderate Activities: Light digging, weapons cleaning, marksmanship range activity, patrolling

Heavy Activities: Force on Force Exercises, Running Qualifications, individual movement techniques, field assaults

OVER-HYDRATION

Proper fluid replacement (hydration) is one of the most essential elements in heat injury prevention. The newly revised fluid replacement chart (below) describes the amounts of fluid replacement and work/rest cycles for acclimated personnel undergoing training. Of particular note is the fact that the revised maximum hourly fluid intake should **NOT** exceed 1.5 quarts and the revised maximum daily intake should **NOT** exceed 12 quarts.

In 1998, the U.S. Army Research Institute for Environmental Medicine (USARIEM) provided revised recommendations. Comments on that document and some additional work performed at USARIEM have resulted in the table below.

WORK / REST / WATER CONSUMPTION TABLE							
Heat Category	**WGBT Index, F**	**Easy Work**		**Moderate Work**		**Hard Work**	
		Work/ Rest (min)	Water Intake, Qt/hr	Work/ Rest (min)	Water Intake, Qt/hr	Work/ Rest (min)	Water Intake, Qt/hr
1	78-81.9	NL	1/2	NL	3/4	40/20	¾
2 (Green)	82-84.9	NL	1/2	50/10	3/4	30/30	1
3 (Yellow)	85-87.9	NL	3/4	40/20	3/4	30/30	1
4 (Red)	88-89.9	NL	3/4	30/30	3/4	20/40	1
5 (Black)	>90	50/10	1	20/40	1	10/50	1

The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specified heat category. Individual water needs will vary +/- qt/hr.
NL= no limit to work time per hour.
Rest means minimal physical activity (sitting or standing), accomplished in shade if possible.
CAUTION: Hourly fluid intake should not exceed 1.5 quarts.
Daily fluid intake should not exceed 12 quarts.
Wearing body armor adds 5F to WBGT Index.
Wearing MOPP or SRF over garment add 10F to WBGT Index.

BASIC HEAT INJURY PREVENTION

1. Consider water a tactical weapon. Drink frequently (see water consumption table).

2. Don't skip meals and add salt to taste.

3. Be aware that dark yellow colored, infrequent urination is a sign of dehydration. Increase water intake.

4. Perform heavy work in the cooler hours of the day, such as early morning or late evening, if possible.

5. Minimize heat stress by decreasing work pace and/or increasing rest periods. (See water consumption table).

6. Be aware that full heat acclimatization takes 1-2 weeks.

7. Consider that personnel undergoing treatment for acute or chronic medical conditions may be at greater risk for heat injury.

HEAT CRAMPS

Symptoms	First Aid
Muscle Cramps of arms, legs and/or stomach. Heavy sweating (wet skin) and extreme thirst may occur.	Move the individual to a shady area and loosen clothing. Drink at least one quart of water mixed with ¼ tsp of salt or sports drink. Watch the individual and continue to give water if they accept it. Get medical help if the cramps continue.

HEAT EXHAUSTION

Symptoms	First Aid
Heavy sweating with pale, moist, cool or hot skin; weakness, dizziness and/or fatigue. Heat cramps, nausea (with or without vomiting/diarrhea), tunnel vision, chills (goose bumps), rapid breathing, confusion, and tingling of the hands and/or feet may occur.	Move the individual to a shady area and loosen/remove clothing. Pour water on the individual and fan to permit a cooling affect. Have the individual slowly drink at least one full quart of water. Elevate the legs. GET MEDICAL HELP IF SYMTOMS CONTINUE (i.e. vomiting) Watch the individual until the symptoms are gone or medical aid arrives.

HEAT STROKE

Symptoms	First Aid
Hot, disorientated, delirious, or unconscious. May have any of the symptoms of heat exhaustion. Sweating may stop (red, flushed, hot dry skin).	HEAT STROKE IS A MEDICAL EMERGENCY EVACUATE to a medical facility IMMEDIATELY. Reduce body temperature. Move the individual to a shady area and loosen/remove clothing. Start cooling the individual immediately. Immerse in water. Fan to cooling. Massage extremities and skin with cool water. Elevate the legs. If conscious, have the individual slowly drink at least one full quart of water.

16.0 APPLICABLE STANDARDS AND GUIDANCE DOCUMENTS

Introduction and Chapter 1

29 CFR 1960, *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.*

DOE G 440.1-1,*Worker Protection Management for DOE Federal and Contractor Employees Guide*.

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*.

Executive Order 12196, *Occupational Safety and Health Programs for Federal Employees.*

Federal Employee Occupational Safety and Health (FEOSH) Handbook.

Occupational Safety and Health Act of 1970.

Chapter 2

29 CFR 1910, *Occupational Safety and Health Standards.*

DOE O 440.1A, *Worker Protection Management for Federal and Contractor Employees.*

Chapter 3

DOE O 440.1A, *Worker Protection Management for Federal and Contractor Employees.*

Federal Employee Occupational Safety and Health (FEOSH) Handbook.

Chapter 4

29 CFR 1960, *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.*

DOE Form 5484.3, Individual Accident/Incident Report.

DOE O 225.1A, Accident Investigations.

DOE G 225.1A-1, *Guide for DOE Order 225.1 Accident Investigations.*

DOE M 231.1-1, *Environment, Safety, and Health Reporting Manual.*

DOE M 231.1-2 *Occurrence Reporting and Processing of Operations Information.*

DOE O 231.1A, Change 1, *Environment, Safety, and Health Reporting*.

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*.

Office of Workers Compensation Programs, OWCP Form CA-1, Federal Employee's Notice of Traumatic Injury Report and Claim for Continuation of Pay/Compensation.

Office of Workers Compensation Programs, OWCP Form CA-2, Notice of Occupational Illness/Disease and Claim for Compensation.

Office of Workers Compensation Programs, OWCP Form CA-16, Authorization for Examination or Treatment.

GSA Form 16, Report of Vehicle Damage.

OSHA Form 300 Log.

Chapter 5

OST Policy 3.07, *Laser Safety/Utilization.*

Applicable 29 CFR 1910, *Occupational Safety and Health Standards.*

American National Standards Institute, ANSI Z136.1-2000, *Safe Use of Lasers.*

American National Standards Institute, ANSI Z49.1, *Safety in Welding, Cutting and Allied Processes*.

American National Standards Institute, ANSI Z88.2, *Practices for Respiratory Protection*.

NFPA 70E, *Electrical Safety Requirements for Employee Workplaces*.

Chapter 6

29 CFR 1910, *Occupational Safety and Health Standards.*

NFPA 101, *Life Safety Code*.

National Safety Council, *Accident Prevention Manual for Industrial Operations*, 11th Edition (two volumes).

NFPA 70, *National Electrical Code*.

Chapter 7

10 CFR 835, *Occupational Radiation Protection.*

49 CFR 172, *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements,* Subpart I (April 1996 - since withdrawn), "Radiation Protection Program."

49 CFR 173, *Shippers – General Requirements for Shipments and Packagings*, Subpart I, "Class 7 (Radioactive) Materials."

DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest*

DOE, Albuquerque Operations Office, Transportation Safeguards Division, Forms AL 5600.3A, B, and C, Shipment Certification/Vehicle Certification.

DOE, Albuquerque Operations Office, Transportation Safeguards Division, *Radiation Protection Program*.

DOE G 441.1-1, *Management and Administration of Radiation Protection Programs*.

DOE G 441.1-2, *Occupational ALARA Program*.

DOE G 441.1-4, *External Dosimetry Program*.

DOE G 441.1-12, *Radiation Safety Training*.

DOE P 441.1, *DOE Radiological Health and Safety Policy.*

NCRP - 59, *Operational Radiation Safety Program,* Section 5.2 (1978).

NCRP - 114, *Maintaining Radiation Protection Records,* Section 4.2 (1992).

Chapter 8

10 CFR 1046, *Physical Protection of Security Interests.*

29 CFR 1910, *Occupational Safety and Health Standards.*

29 CFR 1926, *Safety and Health Regulations for Construction.*

42 USC 2011 et seq., *Atomic Energy Act of 1954 (AEA),* as amended.

American National Standards Institute, ANSI Z136.1-2000, *Safe Use of Lasers.*

American National Standards Institute, ANSI Z136.6-2000, *Safe Use of Lasers.*

American National Standards Institute, ANSI Z87.1-1989, *Practice for Occupational and Educational Eye and Face Protection.*

DoD 6055.9-STD, *Ammunition and Explosives Safety Standards, Assistant Secretary of Defense.*

DOE-STD-1091-96, *Firearms Safety.*

DOE M 440.1-1, *DOE Explosives Safety Manual.*

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*.

DOE M 473.2-2, *Protective Force Program Manual.*

DOE M 473.2.1A, *Firearms Qualification Courses Manual.*

Chapter 9

29 CFR 1910, *Occupational Safety and Health Standards.*

29 CFR 1926, *Safety and Health Regulations for Construction*.

49 CFR 390-397, *Federal Motor Carrier Safety Regulations.*

DoD, *Transportation of Nuclear Weapon Material*, Technical Manual 45-51D.

DOE/NNSA – Sandia National Laboratories, Technical Manual, OST *Tiedown Procedures for Type-B Containers*, Revision 5.

National Safety Council, 1991, *A Guide to Determine Motor Vehicle Accident Preventability,* National Safety Council, Chicago, IL.

Chapter 10

29 CFR 1910.109, *Explosives and Blasting Agents*.

49 CFR 100-180, *Hazardous Material Regulations*.

49 CFR 390-397, *Federal Motor Carrier Safety Regulations.*

DOE M 440.1-1, *DOE Explosives Safety Manual*.

DOE-STD-1091-96, *Firearms Safety*.

DOE O 452.1B, *Nuclear Explosive and Weapon Surety Program.*

DOE O 452.2B, *Safety of Nuclear Explosives Operations.*

DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest.*

Chapter 11

29 CFR 1910, *Occupational Safety and Health Standards,* including Subpart S, 301-399, Subpart O, “Machinery and Machine Guarding,” 1910.147, *The Control of Hazardous Energy (Lockout/Tagout),* and 1910.178, *Powered Industrial Trucks.*

NFPA 70, *National Electrical Code*.

American National Standards Institute, ANSI Z87.1, *Eye and Face Protection.*

American National Standards Institute, ANSI Z41, *Foot Protection.*

American National Standards Institute/ASME B.31, *Piping Code.*

DOE M 440.1-1, *DOE Explosives Safety Manual*.

DOE O 231.1, *Environment, Safety, and Health Reporting*.

DOE O 231.1A, *Occurrence Reporting and Processing of Operations Information.*

DOE O 420.1, *Facility Safety*.

DOE O 440.1A, *Worker Protection Management for Federal and Contractor Employees*.

DOE O 440.2B, *Aviation Management and Safety.*

DOE O 221.1, *Reporting Fraud, Waste, and Abuse to the Office of the Inspector General*.

DOE-STD-1090-01, *Hoisting & Rigging*.

Chapter 12

29 CFR 1910.134, *Respiratory Protection*

ANSI Z88.2-1992, *Respiratory Protection*

DOE O 440.1A, *Worker Protection Management for Federal and Contractor Employees*

29 CFR 1910.95, *Occupational Noise Exposure*

29 CFR 1910.1025, *Lead*

Hearing Conservation Program, OST Form HCP.01, Hearing Conservation Program, General Information.

Hearing Conservation Program, OST Form HCP.02, Hearing Conservation Base Line.

Hearing Conservation Program, OST Form HCP.03, Annual Audiometric Exam, Report of Threshold Shift.

Hearing Conservation Program, OST Form HCP.04, Audiometric Testing Record for Follow-up.

Hearing Conservation Program, OST Form HCP.05, Audiometric Center Evaluation.

Hearing Conservation Program, OST Form HCP.06, Ear, Nose and Throat Evaluation.

Chapter 13

Chapter 14

OST FA Policy 4.04, Employment Requirements for Federal Agents.

OST FA Policy 4.05, Physical Fitness Assessment, Exercise Prescription Program, and Incentive Program.

OST FA Policy 4.06, Job-Sanctioned Physical Fitness for Nuclear Materials Couriers.

OST FA Policy 4.07, Physical Fitness Rehabilitation Program.

Chapter 15

Sustaining Health and Performance in Cold Weather Operations

Heat Acclimatization Guide - Ranger & Airborne School Students (2003)

U. S. Army Research Institute for Environmental Medicine (USARIEM)

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17.0 ACRONYMS

ACL - Administrative Control Level

ALARA - as low as reasonably achievable

ANSI - American National Standards Institute

ARC - Accident Review Committee

ASME - American Society of Mechanical Engineers

CFR - Code of Federal Regulations

CPR - cardiopulmonary resuscitation

CSA - Canadian Standards Association

CTD - Cumulative Trauma Disorder

Db - decibel

DASMASM - Deputy Assistant Secretary for Military Applications

DOD - Department of Defense

DOT - Department of Transportation

DP - Defense Programs

EMT - emergency medical technician

ER - (Safety) Engineering Release

ESS - engagement simulation systems

FDA - Food and Drug Administration

FEOSH - Federal Employee Occupational Safety and Health

FM - Factory Mutual

GFCI - ground fault circuit interrupter

HAR - Hazards Analysis Report

HCPO - Hearing Conservation Program Officer

HR - Hazard/Concern Reporting (Program)

HVAC - heating, ventilation, air conditioning

Hz - hertz

LEL - lower explosive limit

LEV - local exhaust ventilation

MSDS - Material Safety Data Sheet

NEC - National Electrical Code

NEHA - Nuclear Explosive Hazard Assessment

NES - Nuclear Explosive Safety

NESP - Nuclear Explosive Safety Program

NESSG - Nuclear Explosive Safety Study Group

NRR - noise reduction rating

NRTL - nationally recognized testing laboratory

OSHA - Occupational Safety and Health Administration

OTA - Offsite Transportation Authorization

OTC - Offsite Transportation Certificate

PASD - Property and Administrative Services Division

PEL - permissible exposure level

PPE - personal protective equipment

QAPP - Quality Assurance Program Plan

QTS - Qualification Tracking System

RAR - Risk assessment Report

RPP - Radiation Protection Program

S&H - safety and health

SAR - Safety Analysis Report

SAILS - Security Assessments Integration and Liaison Section

S/CIs - suspect and counterfeit items

SER - Safety Evaluation Report

SNL - Sandia National Laboratories

SOP - standard operating procedure

SRT - special response team

SST/ SGT - safe-secure trailer/safeguards transporter

TEDE - total effective dose equivalent

TLD - thermoluminescent dosimeter

TPTs - temporary power taps

TSAR - Transportation Safety Analysis Report

TSS - Transportation Safeguards System

UEL - upper explosive limit

UL - Underwriters Laboratory

ANNEX 1 WORKER PROTECTION REQUIREMENTS – DIVISION BRANCHES CHECKLIST

Appraisal checklist

Programmatic requirements - Divisions and Branches

To complete the assessment, review the following:		**Yes**	**No**
1.	Has a Worker Protection Management Program (WPMP) policy been developed for the organization?		
2.	Does the policy establish a priority for worker safety and health (S&H) over other goals such as training or schedules?		
3.	Does the WPMP Program address the elements required in DOE O 440.1?		
4.	Does the WPMP Program include specific goals and objectives?		
5.	Is there a process in place to determine whether goals and objectives are met?		
6.	Have a sufficient number of worker protection staff been assigned?		
7.	Are S&H staff members adequately trained?		
8.	Have S&H responsibilities been clearly assigned?		
9.	Is adequate funding available to support the WPMP Program needs, such as funds for safety and health personnel, training, monitoring and testing, and personal protective equipment (PPE)?		
10.	Do performance evaluations for managers and supervisors include specific criteria relating to the WPMP Program?		
11.	Do managers understand and accept their responsibility to provide a safe and healthful workplace?		
12.	Have managers received training on their roles and responsibilities in the WPMP Program?		
13.	Is top management actively involved in S&H?		
14.	Are completed hazard reports analyzed for trends or lessons learned?		
15.	Are designs for new facilities, equipment, processes, and procedures evaluated for S&H hazards?		
16.	Is the cost for hazard abatement considered in the budgeting process?		
17.	Does the Human Reliability and Resources Branch (HRRB) maintain a complete and accurate database of injury and illness data?		
18.	Does the HRRB submit a quarterly report to the DOE and all recordable injuries, illnesses, work hours, vehicle usage, and property valuation?		
19.	Does the SSEMD ensure that Sandia National Laboratories (SNL) maintains accurate records of OST personnel radiation exposures?		

To complete the assessment, review the following:	Yes	No
20. Are OST personnel informed of their radiation exposure upon request?		
21. Are annual radiation exposure reports provided to the DOE/NNSA at the required time?		
22. Are radiation reports for terminated employees provided as required?		
23. Are occurrence reports submitted to the DOE on time?		
24. Is there a process in place to track actions taken to correct causes of occurrences?		
25. Are interim and final occurrence reports submitted on time?		
26. Is a process in place to analyze injury and illness reports for trends, common causes, and lessons learned?		
27. Are the results of incident analysis distributed to management, supervisors, and employees?		
28. Are changes made to procedures or processes as a result of incident analysis?		
29. Are hazards identified during incident investigations added to the hazard list?		
30. Is employee training modified as a result of incident analysis?		
31. Does the OST have in place a process to identify S&H training requirements?		
32. Has the OST implemented a radiation program per internal OST policy?		
33. Does the OST radiation program meet the intent of 49 CFR 171-181?		
34. Has a radiation protection point of contact been assigned?		
35. Has the OST implemented an as-low-as-reasonably-achievable (ALARA) policy?		
36. Does the OST review exposure dose limits for its employees?		
37. Are employee radiological records maintained indefinitely?		
38. Do these records contain sufficient information to identify each employee, including social security number?		
39. If internal dose records are kept, do they contain the appropriate information?		
40. Has an Accident Review Committee (ARC) been chartered?		
41. Have members been assigned to the ARC?		

To complete the assessment, review the following:	Yes	No
42. Does the ARC meet at least every 3 months?		
43. Does the ARC develop appropriate recommendations on issues involving vehicle safety?		
44. Are deficiencies related to vehicle safety and recommendations provided to the OST Manager?		
45. Has a system been implemented for the identification and control of suspect and counterfeit items (S/CIs)? [DOE O 440.0A]		
46. Is a process in place to control the introduction of S/CIs through design, procurement, inspection, and maintenance?		
47. Are procedures in place to identify and dispose of S/CIs in safety systems and applications that create hazards?		
48. Are records maintained on S/CIs and associated suppliers?		
49. Are S/CIs reported to the responsible program office, and to the DOE Inspector General, and held for potential litigation?		
50. Are trend analyses conducted and lessons learned issued for use in improving the S/CIs Program?		
51. Is a process in place to ensure that all pressure systems used by the OST are designed, fabricated, tested, inspected, maintained, repaired, and operated by trained and qualified personnel?		
52. Is there a process to ensure that all pressure vessels, air receivers, and supporting piping systems on OST equipment conform to the American Society of Mechanical Engineers (ASME) code, or the strictest applicable state and local codes?		
53. When ASME codes do not apply, do managers implement measures to provide equivalent protection and safety?		
54. Are designs, sketches, and calculations for pressure systems reviewed and approved by an independent professional, or do they receive a formal, documented, organizational peer review?		
55. Are qualified personnel used to inspect materials, in-process fabrication, nondestructive tests, and acceptance tests of pressure systems?		
56. Is documentation available for the traceability and accountability for each pressure vessel or system, including descriptions of design, pressure ratings, testing, operation, repair, and maintenance?		
57. Do OST contracts for aviation support require that aircraft be operated in accordance with Title 14 CFRs?		
58. Has OST submitted an aviation operations plan, and changes implementing DOE O 440.2, to DOE for approval?		
59. Are policies and procedures established for aircraft operations that are outside the scope of Title 14 CFR?		
60. Does OST develop safety documentation for each flight mission that has risks not normally accepted by the public?		
61. Does OST evaluate charter and lease contractors prior to the initiation of flight operations?		

To complete the assessment, review the following:	Yes	No
62. Has a baseline noise survey been conducted for each type of passenger-carrying aircraft?		
63. Is hearing protection available for ground personnel and for passengers in aircraft with high noise levels?		
64. Is a quarterly radiation survey conducted for aircraft that are used to transport radioactive materials?		

ANNEX 2 WORKER PROTECTION – AGENT COMMANDS CHECKLIST

Appraisal checklist
Programmatic requirements - Sections

To complete the assessment, review the following:		Yes	No
1.	Are individual employees evaluated for their performance in supporting the Worker Protection Management Program (WPMP) Program?		
2.	Is management's commitment to safety and health (S&H) communicated to all employees?		
3.	Are the requirements in the WPMP Program implemented through plans or procedures?		
4.	Have other managers and supervisors communicated their S&H policies and expectations to their own employees through policies, briefings, or training?		
5.	Do managers and supervisors reinforce safe work practices through positive feedback?		
6.	Do managers and supervisors take action to correct unsafe behavior?		
7.	Do workers perceive that managers follow S&H rules and expect their workers to also follow rules?		
8.	Do workers feel that managers and supervisors respond to their S&H concerns in a timely manner?		
9.	Do managers hold their employees accountable for S&H performance?		
10.	Are managers and supervisors active in identifying hazards and investigating injuries and illnesses?		
11.	Do employees understand that they have the responsibility to comply with S&H standards, policies, rules, and procedures?		
12.	Do employees report hazards to their supervisor or manager?		
13.	Do workers report on-the-job injuries and illnesses to their supervisor or manager?		
14.	Do workers report incidents involving property damage or vehicle accidents to their supervisor or manager?		
15.	Are employees allowed to participate in the WPMP Program activities on paid time?		
16.	Are employees allowed to accompany inspectors doing workplace inspections?		
17.	Are employees aware of their right to express their concerns over unsafe or unhealthful conditions without reprisal?		

To complete the assessment, review the following:	Yes	No
18. Do workers know that they can decline to perform tasks that pose an imminent danger?		
19. Have workers been provided access to S&H standards, procedures, and other applicable documents?		
20. Are workers offered the opportunity to observe the monitoring for hazardous materials in the workplace?		
21. Are individuals notified when they are overexposed to hazardous materials?		
22. Do workers receive results of workplace inspections and accident investigations on request?		
23. Are all personnel informed of the OST Hazard/Concern Reporting (HR) Program?		
24. Are hazard reports processed through the supervisor to reach the OST Manager or ES&H Branch Leader within 10 days?		
25. Is immediate action taken to abate serious or imminent danger situations?		
26. Are priority corrective measures addressed within 5 working days?		
27. Are identified hazards corrected within 30 days after the manager or supervisor is notified and, if not, is a timetable for correction established?		
28. Are submitters informed of the results of the investigation and final actions?		
29. Is a process in place to identify hazards through scheduled or walk-through inspections?		
30. Are designs for new facilities, equipment, processes, and procedures evaluated for S&H hazards?		
31. Are reports on injuries, illnesses, vehicle accidents, and occurrences routinely reviewed to identify the existence of hazards in the workplace?		
32. Is there a process in place to investigate and evaluate reported hazards?		
33. Are corrective actions prioritized according to the seriousness of the hazards involved?		
34. Are workplaces evaluated to determine whether there are hazards present that require the use of personal protective equipment (PPE)? [1910.132 (d)]		
35. Do OTS managers consult with professional S&H personnel to assist them in determining the need for PPE? [1910.132 (d)]		
36. Is PPE used to abate hazards only if engineering and administrative controls are not feasible? [1910.134 (a)]		
37. Are Material Safety Data Sheets (MSDSs) used to determine whether PPE is required and, if so, what type? [1910.132 (f)]		

To complete the assessment, review the following:		Yes	No
38.	Is the selected PPE appropriate and will it abate the hazard? [1910.132 (d)]		
39.	Are employees informed to notify their supervisor if they are potentially exposed to a hazard that has not been previously identified?		
40.	Are employees informed of their responsibility to promptly report accidents, injuries, and illnesses to their supervisor?		
41.	Are serious accidents reported immediately?		
42.	Is medical care readily available to employees who are injured or become ill?		
43.	Are the forms CA-1 or CA-2 and Form CA-16 completed in a timely fashion for all on-the-job injuries or illnesses?		
44.	Are all vehicle accidents involving $1,000 or more damage reported to the OST supervisor?		
45.	Are accidents involving $5,000 or more damage reported to the facility manager?		
46.	Does a supervisor, section chief, or designee investigate each incident involving an injury or an illness and submit DOE Form 5484.3?		
47.	Are the causes for each incident identified and corrective actions implemented?		
48.	Do the investigation reports show a thorough analysis of causes, rather than a tendency to blame the injured individual?		
49.	Are incidents involving an occurrence reported to the supervisor or branch chief, and then to the site Facility Manager?		
50.	Are an investigation and a root cause analysis conducted for each occurrence?		
51.	Does the process for determining training requirements include a review of the following?		
a.	Job descriptions		
b.	Hazard analyses of job tasks		
c.	Applicable Occupational Safety and Health Administration (OSHA) and American National Standards Institute (ANSI) standards		
d.	DOE Directives		
e.	Accident and occurrence reports		
f.	Reports of self-assessments audits, inspections, and appraisals		
52.	Have employees exposed to hazardous materials received the Hazard Communication training?		
53.	Have managers, supervisors, and other employees received appropriate training on suspect and counterfeit items?		
54.	Are all vehicle operators properly trained and licensed for the type of vehicle they drive?		

To complete the assessment, review the following:	Yes	No
55. Are drivers who carry hazardous materials on public roads properly trained, and are they certified for the commercial drivers license?		
56. Do managers and supervisors correlate training to establish training requirements?		
57. Are accurate records maintained of all the training received by each individual?		
58. Is retraining provided to individuals as a result of substandard performance or involvement in an accident or injury?		
59. Are employees aware that lifting anything over 40 pounds is considered a heavy lift?		
60. Are employees aware of basic rules for safe lifting?		
61. Do employees know how to report fires, are they aware of emergency response procedures, and do they know egress routes?		
62. Are emergency or evacuation drills held periodically?		
63. Are employees aware of and do they know how to avoid and report problems with indoor air quality?		
64. Are employees aware of dose limits and what they mean?		
65. Have any positive steps been taken to ensure that the DOE Radiation Exposure Administrative Control Limit is not exceeded?		
66. Have all OST employees who transport radiological materials or may come into contact with sealed radiological sources been trained on the as-low-as-reasonably-achievable (ALARA) policy?		
67. Have OST employees who may be exposed to radiation received training on its potential hazards?		
68. Is the training provided appropriate to the level of potential exposure?		
69. Do all OST Federal Agents complete the OST General Employee Radiological Training?		
70. Do Federal Agents complete additional radiological orientation?		
71. Is radiological training documented, and do records indicate the level of training completed?		
72. Do employees understand that they are not to enter radiological areas unless they are escorted by designated site personnel and are provided suitable protection equipment?		
73. Are OST personnel who are involved in the transportation of radioactive materials issued a dosimeter as a best management practice (μ <100 mrem/yr)?		

To complete the assessment, review the following:	Yes	No
74. Are individuals who are issued dosimeters formally instructed in their use?		
75. Do employees wear dosimeters when transporting radioactive materials or entering a radiological controlled area?		
76. Do employees understand how to wear the dosimeters and how to take care of them to prevent exposure to heat, x-ray devices, and non-occupational sources of ionizing radiation?		
77. Do employees leave their dosimeters on-site, at designated locations, when not wearing them on official business?		
78. Do employees understand the meaning of posted radiological instructions and restrictions, and do they comply with these?		
79. Are employees trained in the possible consequence of inappropriate use or tampering with dosimeters?		
80. Are new dosimeters issued every 3 months?		
81. To preclude inadvertent exposure and incorrect readings, are old and new dosimeters shipped through a service that does not also ship radioactive materials?		
82. Are employees instructed to report damaged or lost dosimeters to their supervisors as soon as practical so a replacement can be issued?		
83. If a dosimeter is lost or damaged, does the affected individual avoid working in the proximity of radioactive sources until a new one is issued?		
84. Are those employees monitored by the dosimetry program provided with an annual report of their dose and with a report upon request?		
85. Does management ensure that new and current employees have a valid driver's license for the type vehicle or equipment they operate?		
86. Do managers ensure that their employees have received the necessary driver training?		
87. Have arrangements been made for periodic maintenance and repair of vehicles and motorized equipment?		
88. Do drivers of commercial-category vehicles possess a Commercial Drivers License with an "H" or equivalent endorsement?		
89. Does management verify certification of use of Government vehicles to ensure that they are used only for official purposes?		
90. Are drivers instructed to comply with all traffic laws, and traffic control signs and devices?		
91. Do vehicle occupants wear their seat belts and shoulder harnesses when vehicles are in motion?		

To complete the assessment, review the following:	Yes	No
92. Are vehicles checked for safe operation before use?		
93. Do employees who are involved in preventable vehicle accidents receive retraining or counseling?		
94. Do commercial drivers inspect their vehicles according to the Federal Motor Carrier Safety Regulations before use?		
95. Are managers and individuals who handle or store explosives familiar with the requirements of OSHA, DOE, and the Department of Transportation (DOT)?		
96. Are operations involving explosives planned to minimize the handling of explosive materials and the distance an explosive would fall if dropped?		
97. Is the maintenance organization responsive in repairing reported or observed hazards?		
98. Is a fire protection program that meets the requirements in DOE Order 420.1 available at each OST site?		
99. Have managers at each site evaluated the fire hazards to determine the relative level of fire risk?		
100. Has the firefighting agency been provided with training on the locations and types of fire hazards present in each facility?		
101. At every site, if medical assistance is not readily available, have provisions been made to have a person trained to provide first-aid and emergency treatment? [1910.151 (a)]		
102. Are employees aware of the procedures for obtaining emergency and routine medical care for job-related causes and of their responsibility to inform their supervisor or manager when doing so?		
103. Have personnel who are expected to respond to emergencies been trained on the appropriate procedures to protect them from blood borne diseases?		
104. Have off-site emergency response personnel been trained on the location of OST sites and the types of trauma that could potentially require their response?		
105. Are appropriate managers, supervisors, and workers trained on suspect and counterfeit items (S/CIs) controls, including prevention, detection, and disposition?		
106. Do site representatives maintain a list of all chemicals used at their site?		
107. Do site safety advisors ensure that the master list of chemicals is updated by providing lists of new chemicals and deleting those that are no longer used?		
108. Is there a process to review all newly introduced chemicals brought into OST facilities, and does this process involve management, purchasing, engineering, and technical people?		

To complete the assessment, review the following:	Yes	No
109. Are employees trained on the safe use of hazardous chemicals and substances found in their workplace at the initial time of employment and when new hazards are introduced? [1910.1200 (h)]		
110. Have managers identified high noise areas? [1910.95 (a)]		
111. Have managers requested that the supporting industrial hygienist conduct noise level tests of high noise areas?		
112. If the time-weighted average equals or exceeds 85 decibels, have people working in that area been entered into the Hearing Conservation Program? [1910.95 (c)]		
113. If noise levels exceed 90 decibels, have engineering controls been used to reduce the noise exposure below this level? [1910.95 (b)]		
114. If engineering controls are not feasible in high noise areas, has hearing protection been provided to reduce the noise level to 95 decibels or below? [1910.95 (i)]		
115. Have employees been instructed to report high noise areas?		
116. If hearing protection is required, are individuals provided a selection from a variety of types to use, and are they instructed on proper use of hearing protection? [1910.95 (i)]		
117. Do individuals in the Hearing Conservation Program receive an initial or baseline hearing evaluation at the time of employment, or when first assigned to work in a high noise area? [1910.95 (g)]		
118. Is an annual audiogram conducted for individuals in the Hearing Conservation Program? [1910.95 (g)]		
119. If a threshold shift is detected during an audiogram, is the individual scheduled for further testing and evaluation? [1910.95 (g)]		
120. If a permanent threshold shift of 10 decibels or greater has occurred in either or both ears, are reports submitted to DOE and OSHA?		

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ANNEX 3 WORKER PROTECTION - ADMINISTRATIVE CHECKLIST

Appraisal Checklist

Office and Administrative Areas

To complete the assessment, review the following:	Yes	No
1. Are OST Hazard/Concern Report (HR) Forms readily available to all employees?		
2. Is the appropriate DOE Worker Protection Poster posted in the workplace where it is accessible to all workers?		
3. Does the DOE Worker Protection Poster identify the appropriate person for reporting purposes?		
4. Is a copy of the Occupational Safety and Health Administration (OSHA) Form 200 posted in prominent locations at each site during the month of November?		
5. Do employees get help in lifting heavy or awkward pieces of equipment or materials?		
6. Are any hazardous chemicals other than normal commercial products kept in the office area? If so, are they properly labeled and are material safety data sheets (MSDS) available?		
7. Are sharp tools such as scissors, X-Acto® knives, etc., stored in such a manner as to eliminate the potential for cuts or punctures?		
8. Are blades on paper cutters guarded, and are they stored with the blade down and latched?		
9. Are floors maintained and clear of tripping hazards, such as electrical cords, carpet tears, dropped objects, and stored boxes?		
10. Are liquid spills cleaned up in a timely manner?		
11. Are aisles, hallways, and stairs free of obstructions?		
12. Do workers keep their desks, cabinets, and safe drawers closed except when in use?		
13. Do office workers use stools or ladders to reach high areas?		
14. Do workers avoid falls by using handrails, not reading while walking, and not running in office areas?		
15. In file cabinets, are heavy items stored on lower shelves, and are lower shelves loaded first?		
16. Are heavy materials stored appropriately, and not on top of file cabinets?		
17. Do employees close one drawer in a file cabinet before opening another?		
18. Is an emergency/evacuation plan available for each facility or building?		
19. Are emergency and exit routes posted?		
20. If fire extinguishers are provided, are extinguishers of the correct type, and do employees know where extinguishers are located and how to use them?		
21. Has all electrical equipment in office areas been approved by a recognized testing laboratory?		
22. Are electrical cords in good condition (not cut or frayed)?		

To complete the assessment, review the following:	**Yes**	**No**
23. Are there any exposed electrical parts because of missing guards, missing covers, or poor insulation?		
24. Are safety practices followed when using extension cords and power strips?		
25. Are office equipment and furniture arranged to avoid ergonomic stress?		
26. Do people avoid prolonged sitting and strained or awkward postures?		
27. Are computer monitors positioned to prevent unnecessary glare?		
28. Are chairs positioned and adjusted to minimize stress?		
29. Are handrails provided on stairs? [1910.23 (d)]		
30. Are steps on stairs designed or provided with a surface that renders them slip resistant?		
31. Are stair railings of standard height (30 to 34 inches above the surface of the step)? [1910.23 (a)]		
32. Are stairways adequately lit?		
33. Have provisions been made for snow and ice removal on walkways, facility entrances, and sidewalks?		
34. Are obstructions such as tree limbs or parts of equipment prevented from extending out over sidewalks?		
35. Are walking routes and sidewalks from parking lots kept clear of tripping hazards, in good repair, and clear of ice and snow?		
36. Are fire alarms provided at each facility, and do personnel know their location and how to use them? [1910.160 (b)]		
37. Are fire drills conducted periodically for each facility?		
38. Are portable fire extinguishers appropriate for the anticipated class of fire? [1910.38 (c)]		
39. Are the locations of portable fire extinguishers marked, and are extinguishers inspected monthly and provided maintenance annually? [1910.157 (e)]		
40. Are facilities provided with automatic sprinklers, and are sprinkler heads kept free of obstructions?		
41. Are fire doors kept shut unless they are equipped with automatic closing devices that are interlocked with smoke or heat detectors?		
42. Do employees observe “no-smoking” restrictions?		
43. Are there an adequate number of emergency exits available for every building and structure, and from every work area? [1910.36 (b)]		
44. Are exits and exit routes kept clear and unobstructed? [1910.36 (b)]		
45. Are exits and exit routes clearly marked? [1910.36 (b)]		
46. Are exit doors free to open, and not locked or secured by any device that would prevent rapid escape? [1910.36 (f)]		
47. Is an evacuation plan and map available for each facility, and are employees informed as to their responsibilities in case of a fire or other type of emergency evacuation? [1910.36 (b)]		

To complete the assessment, review the following:	Yes	No
48. Is emergency lighting provided if sufficient natural light is not available to illuminate exits and exit routes? [1910.36 (b)]		
49. Do exterior exits discharge directly to a street or other open area? [1910.36 (h)]		
50. Are electrical cords prohibited from being used in lieu of permanent wiring? [1910.305 (a)]		
51. Are electrical cords compatible with, and rated to provide the service required, so as not to become overloaded? [1910.305 (g)]		
52. Are cords routed to avoid resting on pipes or conduits and not run under carpets, furniture, or other areas where abrasion is possible? [1910.305 (a)]		
53. Do electrical cords have a grounding connector, and are they in good condition, free of splices and deteriorated insulation? [1910.303 (c)]		
54. Are all unused openings (including conduit knockouts) on electrical enclosures and fittings enclosed with appropriate covers, plugs, or plates? [1910.305 (b)]		
55. Are electrical outlets that are located within 6 feet of a water source equipped with a ground fault circuit interrupter? [National Electrical Code (NEC)]		
56. Are all chemical containers throughout every OST facility properly labeled as to contents, including chemicals transferred to smaller containers? [1910.1200 (f)]		
57. Do chemical containers, including transfer containers, include the name of the product that can be cross-referenced to the MSDS and any hazard warnings found in the original container?		
58. Are MSDSs available for every chemical? [1910.1200 (e)]		
59. Are MSDSs readily available for review by personnel working with chemicals? [1910.1200 (g)]		

To complete the assessment, review the following:	Yes	No
Comments (indicate the question number):		

ANNEX 4 SHOPS, ARMORIES AND INDUSTRIAL AREAS CHECKLIST

Appraisal checklist

Shops, armories, and industrial areas

To complete the assessment, review the following:	Yes	No
Is a notice posted outside areas that require the use of personal protective equipment (PPE) so that unprotected individuals do not enter?		
Are work areas clean, sanitary, orderly, and adequately illuminated? [1910.22 (a)]		
Are tools and materials stored properly and away from walkways and exits? [1910.176 (c)]		
Do employees pick up scraps and waste material, and do they wipe or sweep up their work areas? [1926.25]		
Are obstructions and combustibles kept away from electrical equipment and electrical panels? [1910.176 (c)]		
Is trash disposed of in proper containers? [1926.25]		
Are tripping hazards, such as electrical cords, pallets, and boxes, removed? [1910.22 (a)]		
Are spilled materials cleaned up promptly? [1910.22 (a)]		
Are temporarily stored materials kept away from aisles, hallways, exit routes, and workspaces? [1910.22 (b)]		
Are electrical cords prevented from being draped over equipment where they could be damaged? [1910.305 (a)]		
Have cleaning materials, such as brooms and dustpans, been provided?		
Have washing and sanitary facilities been provided? [1910.141]		
Are food items restricted from workshops and other industrial areas?		
Are workshops left clean and orderly at the end of each workday? [1910.22 (a)]		
Are aisle floors and walkways well maintained and clear of tripping hazards? [1910.22 (b)]		
Are materials stored in such a way that sharp objects do not interfere with walkways? [1910.22 (a)]		
Do floors provide a non-slippery walking surface? [1910.22 (a)]		
Are all floor and wall openings guarded to protect employees from falling in or through them? [1910.23 (a)]		
Are fire alarms provided at each facility, and do personnel know their location and how to use them? [1910.160 (b)]		
Are portable fire extinguishers appropriate for the anticipated class of fire? [1910.38 (c)]		

To complete the assessment, review the following:	Yes	No
Are the locations of portable fire extinguishers marked, and are extinguishers inspected monthly and provided maintenance annually? [1910.157 (e)]		
Are facilities provided with automatic sprinklers and are sprinkler heads kept free of obstructions?		
Do employees observe “no-smoking” restrictions?		
Are first-aid kits and medical supplies available at remote sites? [DOE-STD-1091-96, Ch. 2]		
Has a physician approved the contents of the medical supply kits? [DOE-STD-1091-96, Ch. 2]		
Are the contents of first-aid kits inventoried periodically and replenished as necessary? [DOE-STD-1091-96, Ch. 2]		
Are eyewash and shower facilities available within the immediate work area, where employees are exposed to injurious materials, such as cleaning solvents? [1910.151 (c)]		
Have electrical tools, machines, and equipment been tested and rated by a recognized testing laboratory? [1910.303 (a)]		
Is all work on de-energized electrical equipment conducted only after complying with lockout/tagout requirements? [1910.333 (b)]		
Are all electrical cords and cable connections to equipment intact and secure? [1910.303 (b)]		
Is sufficient access and space provided and maintained around all electrical equipment to permit ready and safe operation and maintenance? [1910.303 (g)]		
Are all disconnecting switches and circuit breakers labeled to indicate their use and the equipment they serve? [1910.303 (f)]		
Are safety switches marked to show their purpose? [1910.303 (f)]		
Are all electrical equipment and tools maintained in good condition? [1910.334 (a)]		
Are electrical cords prohibited from being used in lieu of permanent wiring? [1910.305 (a)]		
Are electrical cords compatible with, and rated to provide the service required, so as not to become overloaded? [1910.305 (g)]		
Are all machines and electrical tools properly grounded? [1910.334 (a)]		
Are all unused openings (including conduit knockouts) on electrical enclosures and fittings enclosed with appropriate covers, plugs, or plates? [1910.305 (b)]		
Are electrical outlets that are located within 6 feet of a water source equipped with a ground fault circuit interrupter? [National Electrical Code (NEC)]		
Have employees been properly trained to work with any electrical tool, machine, or piece of equipment? [1910.332 (a)]		

To complete the assessment, review the following:	Yes	No
Are manufacturer's operating manuals or other manuals available, and provided for each electrical tool and machine?		
Do employees know the power rating of electrical equipment so as not to overload circuits?		
Are flammable and combustible materials isolated from electrical equipment? [1910.334 (d)]		
Have all machines and tools been tested by a nationally recognized testing laboratory? [1910.303 (a)]		
Is stationary equipment installed according to the manufacturer's instructions and in compliance with the NEC? [1910.303 (b)]		
Are stationary machines secured so that they will not move during use? [1910.212 (b)]		
Is a means for disconnecting each machine provided, located, and marked so that its purpose is obvious? [1910.303 (f)]		
Are machines equipped with a device so that they will not restart automatically after a power failure or shutdown? [1910.213 (b)]		
Are manufacturer manuals or locally developed procedures available for each machine and power tool?		
Are areas around machines and where power tools are used well illuminated and free of obstructions, debris, scraps, and other tripping hazards?		
Are tools and materials stored out of the way to prevent damage and obstruction?		
Are required hazard and warning signs conspicuously posted?		
Is a method of safety guarding provided for each machine to protect from hazards created at the point of operation, in-going nip points, rotating parts, flying chips, and sparks? [1910.212 (a)]		
Are safety guards permanently affixed to the machine whenever possible? [1910.212 (a)]		
If safety guards for each machine have not been provided by the manufacturer, have user-built guards been designed and installed, and do they provide adequate protection? [1910.212 (a)]		
Are safety guards for each machine in good condition, and are they used in accordance with established procedures? [1910.212 (a)]		
Is power disconnected before making adjustments to the machine or to the safety guards? [1910.213 (b)]		
Are hand-feed tools used to place and remove materials in the danger zone? [1910.212 (a)(3)]		
Do operators inspect machines and tools before use to ensure that all parts are in good condition (blades, etc., are sharp) and safety guards are in place? [1910.243 (d)]		

To complete the assessment, review the following:	Yes	No
Is the power source to each machine disconnected and lockout/tagout procedures followed before doing any maintenance? [1910.147 (c)]		
Are saws used for ripping provided with anti-kickback devices? [1910.213 (c)]		
Are radial arm saws installed so that the cutting head will gently return to the back of the table when it is released? [1910.213 (c)]		
Are portable power tools equipped with appropriate safety guards? [1910.243 (a), (c) and (e)]		
Do operators use portable power tools with the correct shield or attachment recommended by the manufacturer? [1910.243 (d)]		
Are tool rests on grinders properly adjusted? [1910.215 (a)(4)]		
If operators have to leave the immediate area, do they shut the machines down?		
Are machines and work processes arranged so that workers do not have to reach over or around a moving part where they could be exposed to hazards? [1910.213 (b)]		
Are machines allowed to come to a complete stop before making adjustments, cleaning the area, or making changes (such as changing bits)?		
Do workers avoid wearing loose jewelry, loose-fitting clothing, and loose badges around machines and moving parts?		
Do workers wear required PPE when working with machines or power tools? [1910.132 (a)]		
If there is a potential for flying chips or other particles, do employees wear safety glasses with side shields and a face shield?		
Are machines and tools inspected according to the manufacturer's instructions and at least annually?		
Is damaged or defective equipment disconnected, and placed out of service using lockout/tagout procedures?		
Is defective or damaged equipment repaired by an authorized person, and is it inspected and tested before being put back in service?		
Do forklifts bear a label or some other identifying mark indicating that they have been tested and approved by a recognized testing laboratory and therefore meet the requirements in American National Standards Institute (ANSI) Standard B56.1? [1910.178 (a)]		
Is the manufacturer's written approval obtained prior to performing modifications or additions to forklifts that affect their capacity or safety of operation? [1910.178 (a)]		
Are nameplates and markings maintained in place and in legible condition? [1910.178 (a)]		
If forklifts are equipped with front-end attachments other than factory-installed equipment, is the forklift marked to identify the attachments, the weight of the truck, and the attachment combination at maximum elevation with the load centered laterally? [1910.178 (a)]		

To complete the assessment, review the following:	Yes	No
Are overhead guards provided for protection against falling objects? [1910.178 (m)]		
If forklifts are used in hazardous environments, such as those containing flammable vapors, are they approved, and do they have the appropriate designation for this use? [1910.178 (a)]		
Are gas- and diesel-powered forklifts operated only in areas that have sufficient ventilation to prevent buildup of carbon monoxide or other toxic gases? [1910.178 (i)]		
Are batteries for electric forklifts charged only in areas designated for that purpose and that have adequate ventilation? [1910.178 (g)]		
Are areas for battery charging provided with an eyewash, materials for neutralizing the electrolyte, and fire protection?		
Is auxiliary lighting provided where there is insufficient natural illumination to allow safe operations? [1910.178 (h)]		
Are only trained and authorized operators permitted to operate forklifts? [1910.178 (i)]		
Are forklifts inspected before use for any condition that could adversely affect their safe operation? [1910.178 (q)]		
Are forklifts removed from service whenever they are found to be defective, in need of repair, or in any way unsafe? [1910.178 (p)]		
Is all forklift maintenance done only by trained and authorized personnel using parts approved by the manufacturer? [1910.178 (q)]		
If forklifts are to be used to lift personnel, have operators been properly trained, and has the forklift been fitted with an approved lifting cage? [1910.178 (m)]		
Are specific procedures available for lockout/tagout of each piece of machinery or equipment? [1910.147 (c)(4)]		
Are lockout/tagout devices individually marked and used only for controlling energy under this program? [1910.147 (c)(5)]		
Are procedures available to test equipment and machines to ensure that energy sources have indeed been removed before work is started? [1910.147 (c)(4)]		
Are all chemical containers throughout every OST facility properly labeled as to contents, including chemicals transferred to smaller containers? [1910.1200 (f)]		
Do chemical containers, including transfer containers, include the name of the product that can be cross-referenced to the material safety data sheets (MSDS) and any hazard warnings found in the original container?		
Are MSDSs available for every chemical? [1910.1200 (e)]		
Are MSDSs readily available for review by personnel working with chemicals? [1910.1200 (g)]		
Do individuals test their self-breathing apparatus each month and before each use? [1910.134 (h)]		
Are air-purifying respirators inspected before and after each use? [1910.134 (h)]		

To complete the assessment, review the following:	**Yes**	**No**
Are the cartridges provided for use with air purifying respirators appropriate for the type of exposure they are intended to prevent?		
Are respirators cleaned after each use and stored in a clean area where they will not be damaged? [1910.134 (c)]		
Are filters replaced as needed to avoid high-pressure resistance when breathing? [1910.134 (g)]		
Are used cartridges disposed of as hazardous waste?		
Do employees wear hearing protection in areas designated as requiring it?		
Comments (indicate the question number):		

ANNEX 5 NUCLEAR EXPLOSIVES SAFETY CHECKLIST

Appraisal checklist
NUCLEAR EXPLOSIVES SAFETY

To complete the assessment, review the following:	Yes	No
A. Use the following items to assess OST compliance with DOE O 452.1A.		
1. Have nuclear safety requirements been included in the contract with Ross Aviation?		
B. Use the following items to assess OST compliance with DOE O 452.2A.		
1. Is there a comprehensive safety program for operations involving the transportation of nuclear explosives?		
2. Have safety lessons learned from critical evaluations of operating experience and other sources of evidence (such as research results and analyses that bear upon the validity of the safety analyses and safety basis under which the nuclear explosive operations are authorized) been evaluated?		
3. Are operations involving the transportation of nuclear explosives conducted in accordance with the applicable Technical Safety Requirements, Nuclear Explosive Safety Rules, and operational safety controls?		
4. Do transportation activities involving nuclear explosives have safety limits, operating limits, surveillance requirements, limiting conditions of operation, and administrative controls, as necessary, that are specified in the operational safety controls and Nuclear Explosive Safety Rules?		
5. Has a system been developed to assist in identifying, tracking, and monitoring required actions related to the safety of nuclear explosives transportation?		
6. Does the Performance Indicator Program for OST include performance indicators for nuclear explosives safety in addition to other environment, safety, and health (ES&H) performance indicators?		
7. Has a safety analysis been performed for all nuclear explosives transportation operations?		
8. Have the results of safety analyses been documented in a Hazards Analysis Report (HAR) for each operation and associated activity?		
9. Are proposed changes to nuclear explosives transportation operations evaluated against applicable nuclear explosives safety documents?		
10. Are nuclear explosives safety studies revalidated every 5 years?		
11. Are nuclear explosives transported offsite in safe-secure trailers (SSTs) or other conveyances specifically reviewed and approved through the study process for nuclear explosives safety?		
12. Are nuclear explosives transported and restrained in compliance with the general instructions of Technical Publication TP 35-51?		
13. Are multiple layers of protection used to prevent accidents and/or mitigate the consequences of an accident?		
14. Is configuration management implemented to ensure that no changes are made that could adversely affect the safety of operations?		
15. Have procedures governing nuclear explosives transportation operations been developed, controlled, reviewed, and approved?		

To complete the assessment, review the following:	Yes	No
16. Have nuclear explosives transportation and associated activities been reviewed to ensure that they comply with the requirements in the OST Worker Protection Management Program (WPMP) program document?		
17. Have exemptions been requested through proper channels when release is sought from a requirement in DOE O 452.2A?		
C. Use the following items to assess OST compliance with DOE 5610.12.		
1. Have DOE 5610.12 and Albuquerque Supplemental Directive (AL SD) 5610.12 been incorporated in the contract with Ross Aviation?		
2. Are nuclear components and special assemblies associated with the nuclear weapons program transported by the OST in a configuration certified or authorized and in a manner that ensures the safety and health of DOE workers, the public, and the environment?		
3. Are safety reviews and offsite transportation operations conducted through a systematic process that considers and evaluates all aspects of operations, identifies risk, and analyzes those operations in terms of worker and public safety, health and protection of the environment?		
4. Are all nuclear material shipments conducted under the authority of DOE 5610.12 and approved by the Manager, AL, with either an Offsite Transportation Certificate (OTC) or an Offsite Transportation Authorization (OTA)?		
5. Are safety levels for expeditious shipments commensurate with those resulting from the formal OTA process?		
6. Are all personnel who support and/or perform packaging and offsite transportation operations appropriately trained and knowledgeable of the regulations to meet the requirements of DOE 5610.12?		
7. Are individuals assigned and trained to oversee compliance with this Order?		
8. Are the Defense Program Transportation Risk Assessment Report and the Transportation Safety Analysis Report reviewed and updated every 5 years or as dictated by programmatic requirements?		
9. Has the capability for technical and safety oversight of the packaging and offsite transportation system in support of the nuclear weapons transportation program been established and maintained?		
10. Do all shipments, to include expeditious shipments outside the formal OTA process, comply with applicable requirements?		
D. Use the following items to assess OST compliance with AL 5610.A.		
1. Does the Manager maintain cognizance of approved appraisal findings and corrective action plans, monitors the status of their implementation, assists the appraising organization in follow-up activities, and reports the status of corrective actions bi-monthly to the Director, Nuclear Explosive Safety Program (NESP)?		
2. Are internal assessments conducted to ensure that activities involving these operations are being performed safely?		
3. Does the OST perform management and independent assessments of nuclear explosives operations?		
E. Use the following items to assess OST compliance with AL 5610.12.		
1. Are the requirements for transportation written and implemented?		

To complete the assessment, review the following:	Yes	No
2. Are steps taken to ensure compliance with the restrictions specified in the OTC or OTA for materials moved in the Transportation Safeguards System (TSS)?		
3. Has a training program been established for Federal Agents to ensure they are knowledgeable and aware of hazardous materials packaging and transportation requirements?		
4. Does OST coordinate the establishment of written safety and emergency procedures to be followed by Federal Agents who have custody of nuclear components, special assemblies, and other designated materials?		
5. Have OST Federal Agents been provided with operating and emergency procedures, and with training that follows requirements and criteria consistent with the OST Quality Assurance Program Plan (QAPP)?		
6. Does OST ensure that nuclear components, special assemblies, and associated material packages are properly secured and supported in accordance with approved tie-down procedures?		
7. Does OST conduct annual safety self-appraisals of the DOE TSS?		
8. Does OST provide copies of all occurrence reports related to the transportation of nuclear components, special assemblies, and other designated materials to NESP, Weapons Security Division (WSD)?		
9. Does OST maintain a DOE/NNSA-approved Transportation Safety Analysis Report (TSAR) and Safety Evaluation Report (SER) for the transportation operations of nuclear components, special assemblies, and other designated materials?		
10. Are tie-down configurations available for secure transport using DOE TSS?		
11. Are requests for tie-down procedure revision submitted to the NESP, WSD for concurrence?		
12. Does OST ensure that all shipments, including expeditious shipments outside the formal OTA process, comply with applicable DOE and regulatory requirements?		
13. Does OST authorize the use of any DOE-approved vehicle other than those required under an OTC, or OTA?		
14. Does Ross Aviation prepare, use, and maintain site-specific written procedures for the management and handling of packages, and the required preparation for offsite transportation of nuclear components, special assemblies, and other designated materials?		
15. Does Ross Aviation develop and implement a Package and Transportation Program Plan in accordance with the *NESP, WSD Packaging and Transportation Guide*, including all section topics of the Manual as section topics in the Package and Transportation Program?		
16. Does Ross Aviation ensure the inventory and control of DOE nuclear components and special assemblies?		
17. Does Ross Aviation prepare and deliver a monthly status report to the NESP, WSD describing the previous month's activities for incorporation into the monthly report to the Deputy Assistant Secretary for Military Applications (DASMA)?		
18. Has Ross Aviation developed and implemented a QAPP that meets all the requirements for packaging configuration and the requirements for product acceptance, as well as technical standards, administrative controls, procedures, and instructions?		
19. Does Ross Aviation submit all Defense Programs (DP)-related packaging and handling equipment (H-gear), including re-certified items, to the DOE/WSD (or their representative) for acceptance?		

To complete the assessment, review the following:	Yes	No
F. Use the following items to assess OST compliance with Occupational Safety and Health Program Requirements in AL SD 5610.11A.		
1. Has an occupational radiation protection program been established and implemented for nuclear explosives operations and associated activities?		
2. Are exposures maintained as low as reasonably achievable (ALARA), consistent with the objective of preventing significant safety incidents involving potentially higher consequences?		
3. Are applicable explosives safety requirements and guidance integrated into the implementation of each affected safety program element?		
4. Are proposed changes (that would affect matters already considered by an NES Study) reviewed for nuclear explosive safety implications by appropriate personnel (assigned nuclear explosive safety responsibilities) to determine if the change requires an NES Study?		
5. Is documentation available to show that OST has certified the qualification of its Nuclear Explosive Safety Study Group (NESSG) members in writing to the Director?		
6. Has OST's *NES Plan of Action* been coordinated with NESP?		
7. Are the scope and objectives of the study, a tentative date on which the input document is required, and a date for the planning meeting included in the Action Plan?		
8. Is the Action Plan distributed to the Director, NESP, and to all affected agencies and personnel?		
9. Does the scope of the planning meeting identify required input document contents and assign organizational responsibilities for input document preparation? Does it develop a schedule for input document preparation and submission, identify organizational points of contact, refine the scope and objectives of the NES Study, and plan briefings, demonstrations, and resources as required to support the study?		
10. Does OST ensure that a program-specific NES Study does not begin until preparatory work on the operation has been completed, including completion of the Nuclear Explosive Hazards Assessment (NEHA) for the operation, and a Safety Engineering Release (SER) when a conditional status has been issued?		
11. Does OST not begin a Master NES Study until preparatory work on the facilities and operations has been completed and the NEHA has been prepared?		
12. Are all the technical data requirements incorporated into the NES Study Input Documentation?		
13. Does OST management coordinate with NESP to determine when an NES Review is required?		

To complete the assessment, review the following:	Yes	No
Comments (indicate the question number):		

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ANNEX 6 MEDICAL PHYSICAL FITNESS AND EMERGENCY RESPONSE CHECKLIST

Appraisal checklist

Medical, Physical Fitness (PF), and Emergency Response (ER) Programs

To complete the assessment, review the following:	**Yes**	**No**
1. Are the Medical Program roles and responsibilities clearly defined and current?		
2. Are the Site Occupational Medical Director (SOMD) and Exercise Physiologists (EPs) under the same contract?		
3. Is Federal Occupational Health (FOH) assessing and reporting to OST medical risks/stresses/issues on a recurring basis?		
4. Has the Medical Case Manager position description been developed?		
5. Is case management and tracking being conducted?		
6. Is a medical issues list maintained and current?		
7. Is a tracking system maintained and current?		
8. Is the policy on medical qualification for the physical performance test being implemented?		
9. Is the committee to coordinate Medical/PF policies meeting regularly?		
10. Has the SOMD concurred on the PF program?		
11. Has OST management concurred on PF policies?		
12. Have the Medical and PF programs been integrated?		
13. Has a physical assessment policy been established?		
14. Are activity-related risks being assessed in the PF program?		
15. Has a bonus program been established as part of the physical assessment policy?		
16. Is there clear justification for the choice of the mile run and 40-yard dash as components of the physical qualification test?		
17. Are ER MOUs in place?		
18. Has oxygen use been medically approved?		
19. Does a list of people approved to administer oxygen exist and is it current?		
20. Has AED use been medically approved?		
21. Have oxygen systems been recommended for procurement?		
22. Have AEDs been recommended for procurement?		
23. Have appropriate individuals been trained in AED/oxygen systems?		
24. Have equipment/qualification lists been developed by site?		
25. Are ER plans in place at all OST sections and Ft. Chaffee and are they updated annually?		
26. Are ER plans exercised annually?		
27. Is there a clear definition of who can time agents during their physical performance test?		

To complete the assessment, review the following:	Yes	No
28. Is there a clear definition of who can time agents who are doing their mile run on a treadmill?		
29. Does OST have current job hazards surveys?		
30. Are hazards surveys updated whenever operations warrant a change, but not less than every 3 years?		
31. Are existing plans incorporated into the OST Emergency Management Plan (EMP) or invoked by reference?		
32. Does OST have a current Hazards Assessment (HA)?		
33. Has the HA been reviewed at least annually and updated prior to significant changes?		
34. Does the HA identify emergency conditions?		
35. Does the HA describe potential health, safety, or environmental impacts?		
36. Does the HA summarize planning and preparedness requirements that apply?		
37. Does the HA include a determination of the size of the Emergency Planning Zone (EPZ)?		
38. Does the OST EMP address the assignment of individuals to the Emergency Response Organization (ERO)?		
39. Have Emergency Action Levels (EALS) been developed for the spectrum of potential Operational Emergencies?		
40. Have offsite response interfaces been developed with organizations responsible for offsite emergency response?		
41. Is refresher training provided annually to certified operators and supervisors and those workers who are likely to witness a hazardous material release and who are required to notify proper authorities of the release?		
42. Is emergency-related information and training available to personnel who may respond to a OST emergency?		
43. Is there prompt initial notification during an emergency?		
44. Are notification and reporting responsibilities established to support appropriate plans and agreements?		
45. Is planned medical support adequate for medical treatment?		
46. Have plans been developed for mass casualty situations?		
47. Are facilities and equipment adequate to support emergency response?		
48. Are building evacuation exercises conducted at least once a year and documented?		
49. Does SECOM test communications systems at least annually or as often as needed to ensure that communications systems are operational?		
50. Do personnel involved in re-entry receive a hazards/safety briefing prior to emergency response activities?		
51. Are there plans for notifications associated with termination of an emergency and establishment of criteria for resumption of normal operations?		

To complete the assessment, review the following:	Yes	No
52. Have initial recommended protective actions for emergencies been predetermined?		
53. Has medical support been planned for workers contaminated by hazardous material?		
54. Are facilities/equipment adequate and maintained to support emergency response?		
55. Are adequate personal protective equipment and other equipment and supplies available and operable?		
56. Are both initial training and annual refresher training provided for instruction and qualification of all personnel?		
57. Do drills provide supervised, “hands-on” training for members of emergency response organizations?		
58. Has a formal exercise program been established to validate the emergency management program?		
59. Is emergency response capability exercised, evaluated, and critiqued annually?		
60. Does DOE/NNSA perform evaluations of annual exercises at least every 3 years?		
61. Do ERO elements and resources participate in at least one exercise annually?		
62. Are offsite EROs invited to participate in exercises at least once every 3 years?		
63. Are exercises with radiological emergency response assets conducted at least once every 3 years?		
Comments (indicate the question number):		

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CRAD 1 EXPLOSIVE TRAINING – SAFETY DOCUMENTATION

Topic: SAFETY
Subtopic: Explosives Safety

Performance Objective: The explosives safety program includes appropriate documentation to ensure implementation of applicable requirements.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
Training			
The explosives safety training and qualification program is documented. DOE M 440.1-1, Chapter V, 3.0		✓	
Training is part of the employee certification and qualification program specified in Chapter V of DOE M 440.1-1 DOE M 440.1-1, Chapter II, 1.6c		✓	
Employee hazardous materials information and training program includes: (specific to explosive safety) a. information on physical and health hazards b. purpose and proper use of engineering controls, work practice controls and protective equipment c. labeling systems and Material Safety Data Sheet terms d. detection methods for the presence or release of hazardous material in the work area DOE M 440.1-1, Chapter V, 3.0b		✓	
The training lesson plan covers applicable explosive handling and storage information. DOE M 440.1-1, Chapter V		✓	
Personnel with responsibility for storage of response munitions are trained in explosives storage and transportation. DOE M 440.1-1, Chapter II, 17.6.4b	✓		

Criteria	Type		
	Essential	Basic	Nice
Training records are documented, on file and maintained for personnel handling and storing explosives. The records include: a. description and dates of training received b. description and dates of refresher training c. a signed "statement of understanding" for operating procedures d. attendance at safety meetings and participation in safety committees e. qualification review by supervisor DOE M 440.1-1, Chapter V, 3.0a(5) DOE M 440.101, Chapter V		✓	
Personnel performing explosives operations are certified by line management as being qualified for assigned duties. DOE M 440.1-1, Chapter V	✓		
After training, workers are qualified for a specific period of time. DOE M 440.1-1, Chapter V, 3.0a		✓	
Giving drivers special training, emphasizing caution and defensive driving. DOE M 440.1-1, Chapter II, 16.2b		✓	
Giving drivers of explosives-carrying vehicles proper training in general safety precautions for explosives handling. DOE M 440.1-1, Chapter II, 16.2c		✓	
Retraining			
Retraining is accomplished for workers in specific areas of weakness or those who violate safe practices. DOE M 440.1-1, Chapter V, 3.0a(2)		✓	
If an operating procedure is substantially modified, all personnel using that procedure are retrained in the new procedure DOE M 440.1-1, Chapter V, 3.0a(3)		✓	
Hazard Analysis			
A hazard analysis is performed prior to beginning any explosives operation and identifies all hazards associated with the operation. DOE M 440.1-1, Chapter II, 1.7/ DOE O 5481.1B DOE M 440.1-1, Chapter II, 1.7/DOE O 5481.1B	✓		

Criteria	Type		
	Essential	Basic	Nice
A hazard risk assessment is performed before starting any explosives operation to identify any abnormal problems that will require special training, equipment, or procedures. DOE M 440.1-1, Chapter VIII, 2.1a	✓		
Hazard analyses are reviewed for applicability when re-starting and changing an operation. DOE M 440.1-1, Chapter II, 1.7/DOE O 5481.1B	✓		
The principles and tables in DoD 6055.9-STD "DoD Ammunition and Explosives Safety Standards" are used to determine: • Total quantities of explosives in adjacent magazines, operating buildings, or other explosives facilities that must be applied to quantity-distance tables • When levels of protection required by Section 4 of this chapter differ from the requirements of DoD 6055.9-STD, Section 4 takes precedence • The minimum separation distances required for facilities are based on the desired level of protection and total quantities of explosives.	✓		
Mixing of storage compatibility groups has been evaluated and does not exceed 1,000 lbs., or the maximum limit authorized for the specific storage facility, if the items are in approved containers. DOE M 440.1-1, Chapter II, 17.4e	✓		
Permissible loading of shelving has been determined. DOE M 440.1-1, Chapter II, 17.2d	✓		
Facilities used for storage of explosives are properly sited for quantity-distance. DOE 440.1-1, Chapter VI	✓		
A current listing of explosives and other hazardous materials used in conjunction with explosives operations is maintained by facility management. Hazard analysis is performed for employee exposures. DOE M 440.1-1, Chapter II, 1.6a,b		✓	
Each type of explosive has been assigned an appropriate storage compatibility group. DOE M 440.1-1, Chapter II, 17.4c	✓		

Criteria	Type		
	Essential	Basic	Nice
To store a new explosive, the new explosive must follow established change control/safety review procedures prior to storing. DOE M 440.1-1, Chapter II, 17.3d	✓		
Emergency Management			
A written plan is in place for controlling emergencies involving explosives. It may be part of the overall emergency control plan for the site/facility. DOE M 440.1-1, Chapter II, 22.2a		✓	
Emergency situations that should be covered in the plan, as applicable to the facility, are: a. fires and explosions b. floods c. extreme weather conditions. d. conditions resulting in environmental disturbances e. civil disturbance f. threats and bomb scares g. enemy attack h. any other emergencies which require rapid mobilization of personnel and equipment DOE M 440.1-1M, Chapter II, 22.2b		✓	
Subjects that should be addressed by the plan are: a. reporting an emergency b. decision to activate the emergency plan c. authority and responsibility for administration and execution of the plan d. mobilization of personnel in combating the emergency e. procedures for combating the emergency or disaster f. accounting for evacuation of personnel g. plan and document security DOE M 440.1-1, Chapter II, 22.2c		✓	
Inspections			
Inspection frequencies, when not otherwise specified, are established by facility management. DOE M 440.1-1, Chapter II, 1.3		✓	
An audit system is established to routinely evaluate the adequacy, availability and currency of procedures. DOE M 440.1-1, Chapter VII, 2.6a		✓	

Criteria	Type		
	Essential	Basic	Nice
Audits include evaluation of operator knowledge and compliance with procedures. DOE M 440.1-1, Chapter VII, 2.6a		✓	
Explosive facilities - the lightning protection systems are appropriately installed, inspected at appropriate intervals, and maintained. Visual Inspections recommended at least every 7 months. Visual Inspections mandatory at least annually Electrical Testing recommended every 14 months Electrical Testing mandatory at least every 47 months DOE M 440.1-1, Chapter II, 6.4 a, b	✓		
Groups conducting audits contain personnel from other than the operating department using the procedure. DOE M 440.1-1, Chapter VII, 2.6b		✓	
Inspection records contain the most recent electrical test report and any subsequent visual inspection reports. DOE M 440.1-1, Chapter II, 6.4c		✓	
Equipment grounds are inspected and tested at required intervals. DOE M 440.1-1, Chapter II, 7.3 DOE M 440.1-1, Chapter II, 7.7		✓	
A total weight inventory is conducted at least annually for each magazine. DOE M 440.1-1, Chapter II, 17.2k		✓	
Mixing of storage compatibility groups has been evaluated and does not exceed 1,000 lbs., or the maximum limit authorized for the specific storage facility, if the items are in approved containers. DOE M 440.1-1, Chapter II, 17.4e		✓	
The facility has a program in place to review the explosives materials stored at that facility. DOE M 440.1-1, Chapter II, 17.3		✓	
Procedures-General Criteria			
General operating procedures are current, written, and approved for each activity. Work control processes are in place prior to any operational activities. DOE M 440.1-1, Chapter VII, 2.4b. DOE M 440.1-1, Chapter VII DOE M 440.1-1, Chapter VII, 2.1c		✓	

Criteria	Type		
	Essential	Basic	Nice
Responsible personnel with knowledge of the operations prepare procedures. DOE M 440.1-1, Chapter VII, 2.3a		✓	
Procedures-Review Criteria			
All new or revised operating procedures are reviewed and approved prior to use. Explosives operating procedures are reviewed at least annually and include Line and safety organizations in the review. DOE M 440.1-1, Chapter VII, 2.4a DOE M 440.1-1, Chapter VII		✓	
Operations are not performed with superseded, inactive, or unapproved procedures; revisions are made to procedures that are not completely applicable or if new safety considerations have been identified. DOE M 440.1-1, Chapter VII, 2.7b DOE M 440.1-1, Chapter VII, 2.5a		✓	
Procedures Criteria – Structure			
The introduction to the procedure contains: a. Statement of scope, defining what facilities and equipment are covered b. Name of department and/or responsible individual c. If the procedure serves as the basis for an exemption or waiver, a statement to that effect and a specific reference to the standard involved DOE M 440.1-1, Chapter VII, 2.8.1a		✓	
The safety section of the procedure contains the following information: a. General safety rules and techniques to be applied, to include personnel control features of the facility b. Personnel number and explosive weight limits c. Additional or specific emergency controls not addressed by the facility emergency plan DOE M 440.1-1, Chapter VII, 2.8.1b DOE M 440.1-1, Chapter VII, 2.8.1c		✓	
Procedures Criteria – Activity Restrictions & Access			
If operation of a particular item of equipment requires no other operation be performed simultaneously in the same area, the requirement is clearly stated in the procedure. DOE M 440.1-1, Chapter VII, 2.8.1c		✓	

Criteria	Type		
	Essential	Basic	Nice
Specific types of equipment and building or area in which the operation is to be conducted are designated in the procedure. DOE M 440.1-1, Chapter VII, 2.3c		✓	
Prohibiting smoking, cooking and eating in explosives storage areas and during handling. DOE M 440.1-1, Chapter II, 5.1,		✓	
Prohibiting flame/spark-producing devices in explosives storage areas and during handling. DOE M 440.1-1, Chapter II, 5.1b		✓	
Controlling entry access into all explosives areas. Limiting the number of personnel present at an operating location to the minimum Establishing personnel limits - allow for necessary casuals Sufficient personnel are available to obtain help and aid the injured No person works alone on high risk activities (facility management specifies which activities may be performed alone. DOE M 440.1-1, Chapter II, 5.3 DOE M 440.1-1, Chapter III, 2.0 DOE M 440.1-1, Chapter III, 2.0b DOE M 440.1-1, Chapter III, 2.0c DOE M 440.1-1, Chapter III, 2.0d		✓	
Prohibiting performance of jobs not necessary to the hazardous explosive operation in the same location. Personnel not needed for the operation are not allowed in hazardous locations. DOE M 440.1-1, Chapter III, 2.0a		✓	
Unless excepted, prohibiting operations involving hazardous materials in magazines. DOE M 440.1-1, Chapter II, 17.2p		✓	
Procedures Criteria – Handling			

Criteria	Type		
	Essential	Basic	Nice
Operations are arranged to minimize manual explosives handling. * One person does not lift more than 25kg of explosive (if it can be securely gripped). * Two people do not lift more than 50kg of explosive. * Any explosive item over 50kg, or which cannot be securely gripped, is not manually handled. DOE M 440.1-1, Chapter II, 14.2a DOE M 440.1-1, Chapter II, 14.2c		✓	
Handling of explosives that cannot be manually handled on suitable carts or hand-trucks that meet specifications. DOE M 440.1-1, Chapter II, 14.3a		✓	
Handling explosives only where areas are free of obstructions and where the walkway surfaces provide positive footing. DOE M 440.1-1, Chapter II, 14.1c		✓	
Prohibiting carrying explosives up or down stairs, except when in protective containers. DOE M 440.1-1, Chapter II, 14.2b		✓	
Prohibiting the handling of explosives and incompatible materials. DOE M 440.1-1, Chapter II, 14.1d		✓	
Disposal (or submittal for disposal) of any explosives that cannot be identified and labeled. DOE M 440.1-1, Chapter II, 14.1h		✓	
Explosives are protected from abnormal stimuli or environments. DOE M 440.1-1, Chapter II, 1, 1.1		✓	
Explosives are removed from bays (rooms) prior to major repairs, changes, or use of hazardous equipment. DOE M 440.1-1, Chapter II, 3.2b		✓	
Procedure Criteria - Weather			
There is a system in place to warn affected personnel of approaching electrical storms. There are procedures covering actions to be taken by explosives personnel in event of an electrical storm DOE M 440.1-1, Chapter II, 6		✓	

Criteria	Type		
	Essential	Basic	Nice
Shutting down operations in and around magazines during an electrical storm in accordance with approved guidelines. DOE M 440.1-1, Chapter II, 6.3 DOE M 440.1-1, Chapter II, 17.2o (General rule applies: terminate operations if electrical storms are within 5 miles or follow resident facility guidelines whichever is more stringent.)		✓	
Procedure Criteria – Inventory Limits & Control			
Establishing a verifiable system to control the amount of explosives in an explosives facility. DOE M 440.1-1, Chapter III, 3.4		✓	
All containers of explosives or explosive assemblies are properly packaged and labeled for contents identification during handling, storage and transportation. DOE M 440.1-1, Chapter II, 14.1g DOE M 440.1-1, Chapter II, 17.2a DOE M 440.1-1, Chapter II, 17.5e		✓	
Limiting the quantity of explosives at an operating location to the minimum necessary to carry out the operation in a safe and efficient manner. Requiring removal of supplies exceeding the minimum quantity from the operating area. DOE M 440.1-1, Chapter III, 1.0		✓	
Explosives shipments are inspected for damage before storage. DOE M 440.1-1, Chapter II, 15.3a		✓	
Contents of a damaged or broken container are removed to another container. Spilled materials are cleaned up before continuing the operation. Explosives in a damaged container are not stored in magazines or re-shipped. Damaged containers are repaired, the contents removed, or the container and contents are placed in a Group L magazine DOE M 440.1-1, Chapter II, 15.3b DOE M 440.1-1, Chapter II, 17.5h DOE M 440.1-1, Chapter II, 15.3c		✓	
Procedure Criteria for Transporting Explosives			
Avoidance of congested areas. DOE M 440.1-1, Chapter II, 16.2d		✓	
Stopping at all railroad crossings. DOE M 440.1-1, Chapter II, 16.2e		✓	

Criteria	Type		
	Essential	Basic	Nice
Prohibiting co-location of personnel in the cargo area and loose items in the cargo compartment. DOE M 440.1-1, Chapter II, 16.2f		✓	
Prohibiting smoking in vehicles containing explosives. DOE M 440.1-1, Chapter II, 16.2g		✓	
Performing regular maintenance checks on the vehicle. DOE M 440.1-1, Chapter II, 16.2h		✓	
Prior to transport, Classifying explosives in accordance with DOT requirements. DOE M 440.1-1, Chapter II, 16.2i		✓	
Other than inspection, containers of explosives are not opened or repaired on any transportation vehicle. DOE M 440.1-1, Chapter II, 16.2j		✓	
Vehicles containing explosives are not fueled, except in an emergency. DOE M 440.1-1, Chapter II, 16.2k		✓	

Approach - Document(s) Review:

- Explosives safety training lesson plan
- Training records
- Property Inventory
- Maintenance Records
- Explosives Safety Hazard Analysis
- Emergency Management Plans
- Operating procedures
- Hazard Analysis

CRAD 2 EXPLOSIVE SAFETY - PERSONNEL INTERVIEW

Topic: SAFETY
Subtopic: Explosives Safety

Performance Objective: Personnel who store or handle explosives are knowledgeable of the associated hazards and appropriate requirements and controls.

Personnel Interview **S**=Supervisors **E**=Employee	Essential	Basic	Nice
(S) Supervisory personnel are responsible for enforcement of the provisions of all procedures used in their jurisdiction. DOE M 440.1-1, Chapter VII, 2.2		✓	
(S) Personnel are not permitted to continue working with explosives if the supervisor, with counsel from medical personnel, determines that the person is unable to perform the task safely. DOE M 440.1-1, Chapter V, 3.0a(4)		✓	
(S) The supervisor may temporarily authorize an employee who has not completed the required training to perform the task, if: a. supervisor determines the employee has a working knowledge adequate to perform the task safely b. a qualified person directly supervises the work DOE M 440.1-1, Chapter V, 3.0a(6)		✓	
(E) Personnel performing explosive operation are able to communicate explosive hazards (e.g., ignition sources, lightning). DOE M 440.101, Chapter V		✓	
(E) Personnel responsible for receipt of explosives are knowledgeable of inspection requirements (including repackaging for those containers that may be damaged.) DOE M 440.1-1, Chapter II, 15.3b DOE M 440.1-1, Chapter II, 17.5h DOE M 440.1-1, Chapter II, 15.3c		✓	
(E) Personnel responsible for storing explosives are knowledgeable of storage requirements (e.g., compatibility, abnormal stimuli or environments) DOE M 440.1-1, Chapter II, 1, 1.1 DOE M 440.1-1, Chapter II, 14.1d DOE M 440.1-1, Chapter II, 17.4a		✓	
(E) Personnel responsible for handling/storing explosives are knowledgeable of activity restrictions (e.g., no smoking, eating, drinking, other operations) DOE M 440.1-1, Chapter II, 5.1		✓	

(E) Personnel responsible for handling/storing explosives are knowledgeable of lifting requirements and restrictions. DOE M 440.1-1, Chapter II, 14.2a DOE M 440.1-1, Chapter II, 14.2c		✓	
(E) Personnel responsible for shipping and storing explosives are knowledgeable of shipping and labeling requirements. DOE M 440.1-1, Chapter II, 14.1g DOE M 440.1-1, Chapter II, 17.2a DOE M 440.1-1, Chapter II, 17.5e		✓	
(E) Personnel who enter storage locations are knowledgeable of access requirements and restrictions. DOE M 440.1-1, Chapter II, 5.3 DOE M 440.1-1, Chapter III, 2.0 DOE M 440.1-1, Chapter III, 2.0b DOE M 440.1-1, Chapter III, 2.0c DOE M 440.1-1, Chapter III, 2.0d		✓	
(E) Personnel who store explosives are knowledgeable of the inventory restrictions and limits for their storage location. DOE M 440.1-1, Chapter III, 1.0		✓	
(E) All facility personnel are trained in the content of the emergency response plan applicable to their area. The plan is available for ready reference. DOE M 440.1-1, Chapter II, 22.2a		✓	

Approach – Personnel Interview:

- Supervisors (Section Chiefs, Unit Commanders, Team Leaders)
- Federal Agents (sample size)
- Armorers/Explosive Property Custodians
- Training Specialist

CRAD 3 EXPLOSIVE SAFETY – STORAGE AND HANDLING

Topic: SAFETY

Subtopic: Explosives Safety

Performance Objective: Explosives are stored and handled in a manner that prevents and/or mitigates inadvertent detonations, personnel injury and damage to equipment and the environment

Criteria	Type		
	Essential	Basic	Nice
Direct Observation **B=Building S=Storage C=Containers**			
Building Criteria			
(B) A 15-m wide firebreak, free from combustible material, is maintained around above ground magazines or facilities, which are not provided with fire resistant exteriors. DOE M 440.1-1, Chapter VI, 5.1	✓		
(B) Vegetation is controlled around ventilators on earth-covered and other storage magazines to prevent transmission of fire and minimize potential damage (grass, brush, forest fire, erosion) to the magazine DOE M 440.1-1, Chapter VI, 5.1 DOE M 440.1-1, Chapter II, 17.1b	✓		
(B) Magazines are kept locked except when operations are in progress. Personnel are present when magazines are unlocked. Doors are unlocked and open when personnel are working inside magazines. DOE M 440.1-1, Chapter II, 17.2j	✓		
(B) Explosives are protected from abnormal stimuli or environments. DOE M 440.1-1, Chapter II, 1, 1.1	✓		
(B) Hard surfaces and edges of equipment that could be struck by accidentally dropped explosives are padded with cushioning mats or coverings, wherever possible. DOE M 440.1-1, Chapter II, 14.1b	✓		
(B) Aisles have unobstructed egress and are wide enough to allow inspection, inventory, sampling and material handling. DOE M 440.1-1, Chapter II, 17.2g DOE M 440.1-1, Chapter II, 17.2h	✓		
(B) At least two fire extinguishers are available for immediate use by personnel working in the magazine area. DOE M 440.1-1, Chapter II, 17.1c	✓		

Criteria	Type		
	Essential	Basic	Nice
(B) Placards, specifying explosives, personnel limits, appropriate fire symbols, and general safety precautions (other symbols which accurately communicate hazards) are posted on or near each door of the magazine or area of storage. DOE M 440.1-1, Chapter II, 22.1 DOE M 440.1-1, Chapter II, 17.1a	✓		
(B) Approved lightning protection systems conform to NFPA 780, Appendix L requirements. All grounds from a structure equipped with lightning protection are interconnected. DOE M 440.1-1, Chapter II, 6.4	✓		
Storage Criteria			
(S) Empty containers, tools, conveyors, lift trucks, and other similar equipment are not stored in magazines containing explosives. DOE M 440.1-1, Chapter II, 17.2m	✓		
(S) Explosives are segregated by lot designation. There is free air circulation to all parts of stacks. DOE M 440.1-1, Chapter II, 17.2f	✓		
(S) The distance explosives can fall, if accidentally dropped, is kept to a minimum. When explosives are stored on magazine shelves the bottom of the container does not exceed 2 meters off the floor. DOE M 440.1-1, Chapter II, 14.1a	✓		
(S) Explosives in storage are properly hazard classified with appropriate quantities and storage compatibility groups assigned. DOE M 440.1-1, Chapter II, 17	✓		
(S) The quantity of explosives in an operating building does not exceed the maximum permitted by the quantity-distance criteria. DOE M 440.1-1, Chapter III, 1.0	✓		
(S) Explosives and containers are safely and securely positioned. Stacks are in stable arrays. DOE M 440.1-1, Chapter II, 17.2c	✓		
(S) Different types of explosives are stored in the magazine if they are compatible. Only compatible explosives are stored together. DOE M 440.1-1, Chapter II, 17.4b DOE M 440.1-1, Chapter II, 14.1d	✓		

Criteria	Type		
	Essential	Basic	Nice
(S) Explosives are not stored with materials or items that increase the risk of initiation or decomposition. Combustible materials are not stored in a magazine containing explosives. Flammable liquid is not stored or used in magazines, unless the liquid is an explosive. DOE M 440.1-1, Chapter II, 17.2n DOE M 440.1-1, Chapter II, 17.4a	✓		
(S) Materials are not left suspended by booms, cranes, or hoists. DOE M 440.1-1, Chapter II, 17.2e	✓		
(S) Whenever possible, explosive pellets and detonators are stored in non-prorogating arrays. When not possible, the items are stored in closed containers, which are labeled to indicate total weight of the explosives contents. DOE M 440.1-1, Chapter II, 17.5f	✓		
(S) Detonators, actuators and EEDs are kept in non-prorogating trays, unless handled individually. DOE M 440.1-1, Chapter II, 14.1e	✓		
Prepositioned response force munitions are stored in original containers, except under emergent circumstances. DOE M 440.1-1, Chapter II, 17.6.4a	✓		
Equipment			
Equipment is checked for design, function, and any condition contraindicated in explosives operations. • Gasoline powered equipment is used only in approved areas. Equipment is equipped as prescribed in this section. • Diesel powered equipment is used only if equipped as listed in 16.1.4a • Battery powered equipment complies with the criteria listed in this section. DOE M 440.1-1, Chapter II, 1.2 DOE M 440.1-1, Chapter II, 16.1.4a DOE M 440.1-1, Chapter II, 16.1.4b DOE M 440.1-1, Chapter II, 16.1.4c	✓		

Criteria	Type		
	Essential	Basic	Nice
Explosives handling carts or hand trucks are provided with brakes and are positively secured when the cart is stationary. All items of mechanical handling equipment are initially proof tested, periodically inspected and maintained in first-class working condition. DOE M 440.1-1, Chapter II, 14.3b DOE M 440.1-1, Chapter II, 14.4a	✓		
Transport - Safe-Secure Trailer shipments are exempt from these guidelines. DOE M 440.1-1, Chapter II, 16.2a			
Explosives shipped on common carriers are packaged and shipped in accordance with DOT regulations. DOE M 440.1-1, Chapter II, 16.1.1a	✓		
Off-site shipments comply with DOT requirements, including vehicle inspection, driver selection, and documentation. DOE M 440.1-1, Chapter II, 16.1.2a	✓		
Driver notification of nature of cargo and fire-fighting criteria is performed, prior to conveyance departing DOE site. DOE M 440.1-1, Chapter II, 16.1.2b	✓		
Cargo type trucks or semi-trailers are used for transport of explosives, when possible. Blocking and bracing is adequate to prevent movement of cargo during transit. DOE M 440.1-1, Chapter II, 16.1.2c	✓		
All DOE explosives-carrying vehicles for on-site transportation are equipped with the following: a. Explosives placards (except for 1.4 items) b. Tiedown bolts, rings, and straps. c. No sharp projections exist in the cargo area. d. Chock blocks are provided. e. A battery quick-disconnect is provided if explosives are left in the vehicle overnight. f. Rear view mirrors are on both sides of the vehicle. g. Two fire extinguishers, 2A10:BC, are provided on the truck. One is mounted on the outside of the vehicle. DOE M 440.1-1, Chapter II, 16.1.2d	✓		
Precautions are taken to avoid ignition of explosives by vehicle exhaust. DOE M 440.1-1, Chapter II, 16.1.2e	✓		

Approach:

Direct Observation(s):

- Perimeter of explosive storage bldgs/areas
- Storage buildings and areas
- Storage building contents
- Containers
- Vehicles used for transport
- Equipment used for transporting explosives

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CRAD 4 FIREARMS SAFETY– POLICIES AND PROCEDURES

Topic: Safety
Subtopic: Firearms Safety

Performance Objective: The Firearms safety program is documented, comprehensive, communicated, and executed in a manner that prevents and/or mitigates negative consequences of firearms related events. Individuals instructing, managing, or performing firearms operations are qualified and certified commensurate with their responsibilities.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
Policies & Procedures – General Criteria			
Policies and procedures clearly define authorities and responsibilities at each level of the organization for the safe use of firearms.		✓	
Non-security firearms policies are written.		✓	
Operating procedures are reviewed annually.		✓	
Operating procedures provide direction on identifying safety concerns.		✓	
Current copies of DOE-STD-1091-96 and associated policies and procedures and instruction manuals on all duty firearms are available		✓	
Policies & Procedures –Transport, Storage & Handling Criteria			
There are policies and procedures covering the safe transportation of munitions and pyrotechnic devices used in firearms operations.		✓	
Operating procedures exist for armory (or other approved area) activities (storage and handling of firearms, ammunition, and cleaning materials)		✓	
Operating procedures include a safety tagout program for defective firearms.		✓	
Policies & Procedures – Incident & Emerg Mngt Reporting			
Accidents/incidents are reported and lessons learned are distributed to prevent recurrence.		✓	

Criteria	Type		
	Essential	Basic	Nice
Procedures for reporting any unauthorized firearms discharges and any significant equipment failures are in place and meet the requirements of DOE-STD-1091-96 and DOE M232.1-1. (e.g., Operations Office, protective force managers, EH-31, and SA-10 are notified).		✓	
Emergency plans and procedures specifically address incidents involving firearms.		✓	
There is an approved plan for handling, treating, and evacuating injured personnel from live fire ranges.		✓	
Emergency response drills are conducted annually.		✓	
Policies & Procedures – Operations Criteria			
Operating procedures address the use of personal protective equipment.		✓	
Operating procedures emphasize safety of participants, observers, and bystanders.		✓	
Operating procedures require the presence, and describe the responsibilities of a designated instructor or safety officer during all firearms training activities.		✓	
Operations procedures address high-risk activities such as loading, unloading, and exchanging firearms.		✓	

Criteria	Type		
	Essential	Basic	Nice
Operating procedures include the specific instructor-to-shooter ratio for each firearm training type. • One-to-One • Automatic fire course • Explosive projectile • Firearm involving movement • Fan of fire over 10 degrees One-to-Four (Outdoor Range) • Requalification with a submachine gun, rifle, or a machine gun in automatic mode using controlled bursts of fire • Night firing and initial training One-to-Five (Indoor Range) • Requalification with a submachine gun, rifle, or a machine gun in automatic mode using controlled bursts of fire • Night firing and initial training One-to-Eight • Any firearm in semiautomatic mode.		✓	
There are written and approved procedures for handling duds at live-fire ranges.		✓	
Firearms Safety Committee			
Field element firearms safety committee is formally organized and chartered.		✓	
Live Rounds are restricted from being carried in the chambers of semiautomatic long guns during normal operations.		✓	
Assessments & Performance Analysis			
Formal appraisals or self-assessments of the safety and health aspects of the safeguards and security program, including firearms safety, are conducted annually.		✓	
Safety personnel or a joint safety/protective force appraisal team conducts formal appraisals annually.		✓	
Safety performance data is compared with similar operations and programs to determine if there are lessons to be learned or corrective actions.		✓	

Criteria	Type		
	Essential	Basic	Nice
The following information is reviewed during appraisals: • Records of unauthorized firearms discharges, investigations, and application of lessons learned, • Records and armorer's logbooks of firearms inspections, malfunctions, and repairs; • Firearms documentation indicating that deficiencies have been completed and recorded • Safety performance data compared w/similar operations & programs for lessons learned &/or corrective action • Documentation of hazardous incidents involving firearms and associated equipment • Policy on disciplinary actions for violations of firearms safety procedures or regulations • Results of airborne lead monitoring, blood lead level tests, and hearing conservation		✓	
Lead Testing/Hearing Conservation			
Airborne lead concentrations are measured semi-annually in conformance with the Lead Testing Program and 29CFR1910.1025.		✓	
All personnel involved in regular firearms training have been placed in a hearing conservation program.		✓	
Findings from formal annual appraisals of firearms safety should receive management review and should document tracking to ensure that findings are addressed.		✓	
Training			
Training records document that personnel authorized to remain in armed status have demonstrated their technical and practical knowledge of firearms safety on a quarterly basis.		✓	
Firearms training instructors are certified by the NTC to the level that they are training to.	✓		
Standard DOE training programs and attachments for firearms are available and current.		✓	
Lesson plans incorporate safety in addition to other training objectives and task performance standards.		✓	
Lesson plans include a safety briefing of all participants and authorized observers.		✓	
The safety briefing is given by experienced and knowledgeable personnel.		✓	

Criteria	Type		
	Essential	Basic	Nice
Firearms training lesson plans include • General safety orientation • Instructions on the capabilities of firearms, ammunition and implications. • Safety information for each firearm type that an individual may be assigned to carry. • Practice w/an unloaded firearm in a teaching environment. • Range safety procedures and demonstration of safe firing techniques on the range. • Dry-firing techniques and hazards associated w/dry-firing. • Handling of misfires. • Procedures on clearing, handling of malfunctions, inspecting, cleaning, loading, unloading, related to each firearm used. • Instruction on hazards associated w/impact of bullets and other projectiles into nuclear explosives, nuclear weapons, and other explosives. • Details on firearms accidents & how they could have been prevented.		✓	
Advanced firearms training and special response team training meets the same requirements as basic training.		✓	
Eye and hearing protection is required to be worn during all firearms training.		✓	
Risk assessment			
Risk assessments are completed prior to implementing any new training or evaluation method involving firearms incidents.		✓	
The site used for basic firearms training has been approved by the Manager of the Operations Office.		✓	
An RAR or SAR has been prepared on the facilities and operations of each live-fire range.		✓	
Formal site range safety rules and regulations have been implemented and they include pre-and post-firing range activities.		✓	
Personnel Interview			
Personnel responsible for the direction and operation of the firearms safety program are professionally qualified.		✓	
Personnel responsible for the direction and operation of the firearms safety program have sufficient time and authority to implement the established program.		✓	

Criteria	Type		
	Essential	Basic	Nice
Personnel clearly understand their authorities, responsibilities, accountabilities, and interfaces with support groups.		✓	
Personnel understand their responsibility to comply with the organization's personnel protection and safety rules.		✓	
Supervisors/Instructors understand their responsibility to deny issuance of firearms and remove from duty station personnel that are detected to be under the influence of alcohol or drugs.		✓	
Personnel are knowledgeable of DOE-STD-1091-96 and instruction manuals on the duty firearms assigned to them.		✓	
Personnel assigned responsibility for performance reporting and analysis are knowledgeable of the process used to evaluate and report performance.		✓	
Personnel understand their responsibility to report all injuries/illnesses sustained during firearms training to the instructor.		✓	
Personnel (DOE & contractor) are knowledgeable of their rights and responsibilities to lodge formal complaints about deficient safety practices or procedures in accordance with DOE 3790.1B and 5483.1A.		✓	
Personnel are trained and instructed on what constitutes an unsafe range condition and to shout "cease fire" when such a condition is observed.		✓	
Personnel taking medication understand their responsibility to inform firearms staff before reporting to the firing line.		✓	
Instructors are knowledgeable of incident logs and reporting of firearms incidents.		✓	
Firearms			
All duty firearms are carried in the manner approved by the cognizant local DOE authority for safeguards and security.		✓	
Live Rounds are never carried in the firing chambers of semiautomatic long guns except in imminent life-threatening situations and in handguns unless the site has an approved training program.	✓		
Firearms are mounted in an appropriate rack/container when carried in vehicles, watercraft, and/or aircraft.	✓		
Personnel comply with personal protective and safety equipment rules.	✓		

Criteria	Type		
	Essential	Basic	Nice
A certified firearms instructor supervises loading and clearing of firearms.	✓		
Loading and clearing of firearms takes place only in approved areas or when the barrel of the firearm is in or pointing toward a bullet containment device.	✓		
Range Operations			
A Safety briefing is conducted before firing commences and includes basic range safety rules, capabilities of the firearms to be used, and safe operating procedures for the course of fire to be undertaken.	✓		
Dry-firing is allowed only on the firing range or other approved area under the direct supervision of a firearms instructor.	✓		
A Scarlet streamer is displayed during daylight and a flashing red light is displayed at nighttime before and during firing at outdoor firing ranges.	✓		
The Federal Aviation Administration or other aviation control center is notified of any live-fire range schedules and activities that have the potential to affect aircraft operations.	✓		
(If an EMT or equivalent is not present) Instructors are current and qualified in CPR, first aid training, including specific training in treatment of gunshot wounds.	✓		
There is a communication system with a backup available at each live fire range.	✓		
Shooter-to-target distances for steel targets are greater than 21 feet (150 feet for shotguns slugs).	✓		
The design and method of deployment of steel targets have been approved by the appropriate DOE official in consultation with the NTC.	✓		
Steel targets are examined prior to each use. Targets that bow in excess of 10 degrees and/or contain dimples in excess of 1/16th " in depth are removed from use.	✓		
Lighting is sufficient to ensure nighttime firing exercises are safe.	✓		
The procedure for handling duds at the live fire range is available and is written and approved.	✓		
Site range safety rules and regulations are conspicuously posted and contain the following:		✓	
Mandatory eye and sound barrier-type ear protection		✓	

Criteria	Type		
	Essential	Basic	Nice
(Other than duty equipment) firearms and ammunition are limited to those scheduled for use.		✓	
Firearms are exchanged only at the direction of the instructor.		✓	
Prior to exchange the Instructor verifies that the cylinder or action of the firearm is open and chamber is empty.		✓	
Both parties check the firearm for safety.		✓	
Firearms are carried in the manner specified in the appropriate instruction manual.		✓	
Firearms are not left unattended or unsecured.		✓	
Fingers are not placed on the firearms trigger or in the trigger guard until firearm is pointed at the target.		✓	
Firearm loading and unloading commences only on command.		✓	
Shooters are not permitted to talk while on the firing line (Except to address an instructor or to shout “cease fire” in an unsafe situation.)		✓	
Shooters are not permitted to bend over or move over the line until the firing line has been declared safe by the firearms instructor.		✓	
Shooters are trained and instructed on what constitutes an unsafe condition and to shout “cease fire” when such a condition is observed.		✓	
Smoking, eating, and/or drinking is prohibited on the firing line.		✓	
Alcoholic beverages and drugs are prohibited on firing ranges.		✓	
Shooters taking medication inform firearms staff before reporting to the firing line.		✓	
Spent-cartridge deflectors (when available and practical) are required for all shooters.		✓	
Firearms are examined by the shooter and by a range officer to ensure it is unloaded and in a safe condition before the shooter leaves the range.		✓	
Shooters collect unexpended ammunition and return it to a range officer.		✓	
Shooters collect brass for proper disposal, checking for live rounds.		✓	
Shooters ensure their firearms are properly cleaned, stored and secured after firing.		✓	
The cognizant site physician or other authorized personnel have determined the type of medical equipment to be available at the live-fire range.		✓	
Firearms Transport, Handling, & Storage			
Firearms Maintenance			

Criteria	Type		
	Essential	Basic	Nice
Live ammunition is not allowed in the firearm cleaning area during cleaning	✓	b	
The armorers have completed a factory-authorized or military-approved training course for each firearm available for duty-use.	✓		
Armorers are NNSI-certified and re-certified every 2 years.	✓		
Armorers perform semi-annual inspections and certify for use all firearms available for duty-issue.	✓		
Armorers maintain accurate individual inspection and repair records on all firearms.	✓		
Armorers inspect and conduct test firing of a firearm following any unusual operation or occurrence involving that firearm.	✓		
Armorers tag out-of-service weapons following an unusual operation until certified safe to operate.	✓		

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CRAD 5 FIRE PROTECTION SYSTEMS - -INSPECTION, TESTING, AND MAINTENANCE

Topic: Fire Protection
Subtopic: Inspection, Testing and Maintenance

Performance Objective: Fire protection systems are inspected, tested and maintained based on current industry standards, such as those established by the NFPA, OSHA, and referenced publications.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
The site fire protection inspection, testing and maintenance procedure meets the requirements of NFPA 25 and referenced standards.		X	
Fire protection inspection records are current and maintained.		X	
Fire protection testing records are current and maintained.		X	
Fire protection maintenance records are current and maintained.		X	
Personnel Interview			
Site personnel are aware of when compensatory measures are required.		X	
Compensatory measures are implemented when fire protection equipment fails.		X	
Activity Observation			
Fire Protection Systems			
Minimum requirements for the periodic inspection of water based fire protection systems are being met as required by NFPA 25 and referenced documents.		X	
Minimum requirements for the periodic inspection of related, water based fire protection systems components (i.e. sprinklers, valves, gauges, etc.), are being met as required by NFPA 25 and referenced documents.		X	
Minimum requirements for the periodic testing of water based fire protection systems are being met as required by NFPA 25 and referenced documents.		X	
Minimum requirements for the periodic testing of related, water based fire protection systems components, are being met as required by NFPA 25 and referenced documents.		X	

Criteria	Type		
	Essential	Basic	Nice
Minimum requirements for the periodic maintenance of water based fire protection systems are being met as required by NFPA 25 and referenced documents.		X	
Minimum requirements for the periodic maintenance of related, water based fire protection systems components, are being met as required by NFPA 25 and referenced documents.			
Inspection, testing, and maintenance of fire protection systems and related components are conducted by qualified personnel only.		X	
Portable fire extinguishers			
Portable fire extinguishers are identified, mounted and located where readily accessible		X	
Extinguishers are maintained in fully charged and operable condition.		X	
All soldered or riveted shell invertible extinguishers removed from service		X	
Extinguishers provided for employee use selected on size and degree of hazard in the work area		X	
Travel distance for each class of fire hazard; 75 feet for Class A, 50 feet for Class B		X	
Portable fire extinguishers are inspected monthly.		X	
Annual inspections are conducted and recorded.		X	
Hydrostatic testing has been completed as applicable.		X	
Alternative protection is provided when portable extinguishers are out of service.		X	
Employees are trained on use of fire extinguishers to fight fires in their incipient stage.		X	
Training in the usage of appropriate fire fighting equipment is hands on.		X	
Standpipe and hose systems			
Hose connections and outlets accessible		X	
Annual inspection of hose systems		X	
Conduct a walk through inspection of facilities for general fire protection compliance status.		X	
Conduct a walk through to view installation, orientation and maintenance status of sprinkler heads.			X
Conduct a walk through to ensure fire loading is not excessive.			X

Approach:

Documents Review:

- Fire protection inspection, testing and maintenance procedures
- Fire Protection equipment maintenance records
- Fire Extinguisher tags and inspection Records

Personnel Interview(s):

- Maintenance personnel
- Site Safety Advisor

Activity Observation:

- Facility walk through
- Fire system inspection
- Fire extinguisher inspection

References:

- DOE O 360.1
- DOE O 420.1
- NFPA 101
- NFPA 25
- NFPA 10
- NFPA 1
- 29 CFR 1910
- Local Fire code
- Local Plumbing code

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CRAD 6 FIRE PROTECTION - ASSESSMENTS

Topic: Fire Protection
Subtopic: Fire Safety Assessment

Performance Objective: Fire safety assessments of a facility are performed to ensure DOE's fire safety policy objectives are met.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
Only qualified fire protection personnel are conducting fire safety assessments at each OTS site.		X	
Any fire safety exemptions or equivalencies are documented and sufficiently justified.		X	
Review fire safety report concerns/observations to ensure corrective actions are being performed.		X	
Review maintenance requests/logs		X	
Review maintenance forms, tests and inspection reports		X	
Personnel Interview			
Site Safety Representative		X	
Building Emergency Team member		X	
Appropriate maintenance support personnel		X	
Activity Observation			
Facilities meet or exceed the fire safety assessment requirements listed in applicable DOE Orders, other applicable fire safety regulations, and referenced industry standards (see "References" below).		X	
Site personnel are ensuring corrective actions from previous fire safety assessments are monitored and on schedule.		X	

Approach:

Documents Review:

Facility fire safety assessment reports

Facility maintenance logs/records

Test and inspection records

Personnel Interview(s):
Site Safety Advisor
Appropriate Maintenance personnel

Activity Observation:
Walk down of buildings/structures

References:
Code of Federal Regulations (CFR) 29, Part 1910, General Industry Occupational Safety & Health Standards.

CFR 29, Part 1926, Safety & Health Regulations for Construction.

National Fire Protection Association (NFPA) Codes and Standards .

DOE-STD-1088-95, Fire for Relocatable Structures".

DOE-STD-1061-XX, Fire Protection Design Criteria" (in draft).

DOE Explosives Safety Manual, DOE/EV/06194.

Uniform Building Code or local building code (if the local code is enforced on site) and the companion fire code for the governing building code.

DOE Fire Protection Resource Manual (Handbook), DOE-HDBK-1060-XX.

Department of Defense Instruction Number 6055.6, December 15, 1994, "Fire and Emergency Services Program".

National Fire Association Handbooks, Guides and Recommended Practices.

Factory Mutual Loss Prevention Data Sheets.

Society of Fire Protection Engineers (SFPE) Handbook.

American Petroleum Institute Guidelines

CRAD 7 FIRE PROTECTION - TRAINING

Topic: Fire Protection
Subtopic: Fire safety training

Performance Objective: All site personnel are trained and sufficiently exercised on their fire protection roles and responsibilities.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
Site specific fire protection training is being accomplished which satisfies the requirements of applicable DOE Orders, standards, and other referenced fire protection criteria		X	
All personnel receive initial fire safety and annual refresher training.		X	
Initial and annual fire safety training is documented in the individuals training records.		X	
Personnel with responsibilities for fighting fires in their incipient stages are identified in writing.		X	
Personnel with responsibilities for fighting incipient fires are receiving appropriate hands –on training in fire fighting duties and responsibilities		X	
Hands-on fire extinguisher training is conducted for personnel with responsibilities for fighting fires in their incipient stage.		X	
Hands-on fire extinguisher training is conducted upon assignment of fire fighter duties and initially thereafter		X	
Fire fighter training is documented in the individual training records of each assigned individual		X	
Training records of individuals with fire protection program responsibilities are readily available and in auditable form		X	
Fire drills and fire protection exercises are conducted at least annually		X	
Fire drills and emergency exercises are documented		X	
Fire drills and emergency exercises are critiqued		X	
Personnel Interview			

Criteria	Type		
	Essential	Basic	Nice
Fire protection personnel are interviewed to assess the extent of their understanding of their responsibilities.		X	
Facility occupants are interviewed to ensure their understanding of fire fighting responsibilities and emergency actions to be taken.		X	
Training managers (personnel with responsibilities for training and training records) are interviewed to determine the extent of understanding of program training requirements.		X	
Activity Observation			
Observe a fire drill or exercise.			X
Observe training session			X
Review training lesson plans			X
Review training documentation		X	
Review training records		X	

Approach:

Documents Review:

Training records
Training documentation
Lesson plans

Personnel Interview(s):

Instructors with fire protection duties for field operations
Building emergency team members
Facility occupants

Activity Observation:

Conduct a fire drill
Observe training session (if available)

References:

DOE O 360.1
DOE O 420.1
DOE O 440.1
NFPA 1
NFPA 101
10 CFR 830.330

29 CFR 1910
29 CFR 1926
29 CFR 1960, Subpart H
Department of Energy, Occupational Safety And Health Training Program Management Guide (Draft), November 1992, prepared by Pacific Northwest Laboratory.
OSHA Publication 2254, *Training Requirements in OSHA Standards and Training Guidelines.*

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CRAD 8 FIRE PROTECTION – LIFE SAFETY CODE/FACILITIES

Topic: Fire Protection
Subtopic: Means of Egress

Performance Objective: Every building or structure in which OTS personnel work shall be provided with exits sufficient to permit the prompt escape of occupants in the case of fire or other emergency.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
General requirements			
All buildings or structures are provided with unobstructed egress.	X		
All building exits are not locked.	X		
Fire door is maintained in proper operating condition.		X	
All sprinkler systems, fire detection and fire alarms, exits, lighting, and other equipment are serviceable and being maintained in operating condition.	X		
Means of egress, general.			
All exits are easily located and readily accessible.		X	
All means of egress are substantially level.		X	
Exit are marked with clearly visible sign.		X	
Non-exit doors are clearly marked for purpose, "N0T AN EXIT", or similar designation.		X	
Exits are clearly marked with arrows indicating direction of exit.		X	
Means of egress are continuously maintained and free of obstructions.		X	
Employee emergency plans and fire prevention plans.			

Criteria	Type		
	Essential	Basic	Nice
Emergency plan of action is in writing and available.		X	
Written emergency plan of action contains designated employee actions.		X	
Fire prevention plan covers all major workplace fire hazards.		X	
Personnel Interview			
Site Safety Advisors	X		
Building Emergency Team Members		X	
Facility Occupants		X	
Activity Observation			
Walk through facility structures to ensure appropriate exits per Life Safety Code, according to the structure's occupancy classification.		X	
Walk through facility structures to ensure exits and exit pathways are unobstructed and marked.		X	
Walk through facility structures to ensure exits and exit pathways have adequate and reliable illumination.		X	

Approach:

Documents Review:
Facility Emergency Plan
Emergency Floor Plans

Personnel Interview(s):
Site Safety Advisor
Facility Occupants
Building Emergency Team Members

Activity Observation: Walk through of facility

References:
29 CFR 1910.36 through 38

CRAD 9 FIRE PROTECTION - MANAGEMENT

Topic: Fire Protection
Subtopic: Program Management

Performance Objective: The site fire protection program shall meet or exceed (when necessary to meet fire safety objectives) the requirements of DOE Orders, NFPA and other referenced safety criteria.

Criteria	Type		
	Essential	Basic	Nice
Document Review			
A policy statement exists (either with the host or at the site) that incorporates the requirements of applicable DOE Orders and directives, and other applicable Federal, state and local fire protection requirements. The statement should affirm management's commitment to support a level of fire protection and fire suppression capability sufficient to minimize losses from fire and related hazards consistent with the best class of protected property in private industry.	X		
Comprehensive, written fire protection criteria exists that reflect additional site-specific aspects of the fire protection program. This criteria should include: the organization, training and responsibilities of the fire protection staff (if applicable); administrative aspects of the fire protection program; and, requirements for the design, installation, operability, inspection, maintenance and testing of fire protection systems.		X	
Written fire safety procedures exist which govern the use and storage of combustible, flammable, radioactive, and hazardous materials, so as to minimize the risk from fire. Such procedures should also exist for fire protection system impairments and for activities such as smoking, hot work, safe operation of process equipment, and other fire prevention measures, which contribute to the decrease in fire risk.		X	
A system to ensure that the requirements of the DOE fire protection program are documented and incorporated in the plans and specifications for all new facilities and for significant modifications of existing facilities exists. This includes a documented review by a qualified fire protection engineer of plans, specifications, procedures, and acceptance tests.		X	

Criteria	Type		
	Essential	Basic	Nice
Fire hazards analyses (FHA) are conducted for all nuclear facilities, significant new facilities and facilities that represent unique or significant fire safety risks. The FHA should be developed using a graded approach. The conclusions of the FHA should be incorporated in the Safety Analysis Report (SAR) Accident Analysis and should be integrated into design basis and beyond design basis accident conditions if applicable.		X	
Access to a qualified and trained fire protection staff, including a fire protection engineer(s), technicians and fire-fighting personnel to implement the requirements of this Order is readily available.		X	
A "baseline" needs assessment that establishes the minimum required capabilities of site fire- fighting forces has been conducted. This includes minimum staffing, apparatus, facilities, equipment, training, fire pre-plans, off-site assistance requirements, and procedures. Information from this assessment is incorporated into the site Emergency Plan.		X	
Written pre-fire strategies, plans, and standard operating procedures to enhance the effectiveness of site fire-fighting forces are available. Such procedures include those governing the use of fire-fighting water or other neutron-moderating materials to suppress fire within or adjacent to moderation controlled areas if applicable. Restrictions on the use of water should be fully justified on the basis of criticality safety.		X	
A comprehensive, documented fire protection self-assessment program, which includes all aspects (program and facility) of the fire protection program is in place. Assessments should be performed on a regular basis at a frequency established by DOE.		X	
A program to identify, prioritize and monitor the status of fire protection-related appraisal findings/recommendations, until final resolution is achieved, is in place. When final resolution will be significantly delayed, appropriate interim compensatory measures should be implemented to minimize the fire risk.		X	
A process for reviewing and recommending approval of fire safety "equivalencies" and "exemptions" to the DOE exists		X	
The site has access to a fully equipped, staffed and trained emergency response force that is capable of effectively responding to a fire and other emergencies in a timely manner.		X	
Fire protection maintenance records are current and maintained.		X	
Personnel Interview			

Criteria	Type		
	Essential	Basic	Nice
Site Safety Advisor is knowledgeable of Fire Protection Program Requirements		X	
Site personnel are knowledgeable of their role in the fire protection program and take an active role in the program.		X	
Off-site emergency response organizations are familiar with the site.			
Activity Observation			
Site Safety Advisor controls and/or maintains files, records, memoranda, etc. necessary to demonstrate the status and depth of the Fire Protection Program.			X
Training records reflect the requirements and status of individual personnel, fire protection program requirements (i.e. egress, fire extinguisher, response, etc.).			X
Conduct an inspection of fire extinguishers to ensure they indicate that the required testing and maintenance has been performed by appropriate personnel.			X
Conduct a walk through inspection of facilities for general fire protection compliance status.		X	
Conduct a walk through to view and ensure sprinkler heads not being blocked.			X
Conduct a walk through to ensure fire loading is not excessive.			X

Approach:

Documents Review:

Fire protection program policies and procedures; maintenance, test, and inspection records and procedures

Facility maps

Emergency response plans

Memoranda of Agreement (as appropriate)

Contractor Scopes of Work (as applicable)

Other support agreements (as appropriate)

Personnel Interview(s):

Site Safety Advisor

Site Personnel

Off site Emergency response/ fire protection personnel as needed

Activity Observation:

Paperwork review

View emergency response exercise

Facility walk through

CRAD 10 INDUSTRIAL HYGIENE AND OFFICE SAFETY

Topic: Industrial Hygiene and Office Safety
Subtopic: Industrial Hygiene

Performance Objective: *Provide a safe, efficient workplace by implementing requirements that prevent/mitigate industrial hygiene hazards (e.g., housekeeping, walking/working surfaces, and routine medical services).*

Criteria	Type		
	Essential	Basic	Nice
Document Review			
Forklifts – Documentation exists to show that each employee who operates forklifts has received initial or refresher training within the last three years.		X	
Medical Services – A written plan exists for handling, treating, and evacuating injured personnel.		X	
Material Safety Data Sheets (MSDS) for all chemicals and substances found in the work place which are known to pose a health or physical hazard, such as cleaning solution, are available in the area where the chemicals are used, stored, or handled.		X	
A Master List of Hazardous Chemicals and substances known to be in the workplace is available to all employees and visitors.		X	
The Master List of Hazardous Chemicals uses the same names as the MSDS.		X	
Personnel Interviews			
Employee Access to Information – *Employees indicate that they are informed of, and have access to, the FEOSH Manual and the OSHA Hazard Communication standard*.		X	
Employee Access to Information – *Employees indicate that they have been trained in the physical and health hazards of the chemicals in the work area.*		X	
Employee Access to Information – Employees indicate that they have been trained in the measures they can take to protect themselves.		X	

Criteria	Type		
	Essential	Basic	Nice
Employee Access to Information - Employees indicate that they have been trained in the details of the Hazard Communication Program, including the container labeling requirements.		X	
Hazardous Chemical Warnings - Contractors and visitors who may be exposed to hazardous substances indicate that they have been given hazardous chemical warnings.		X	
Electrical Safety – *Employees indicate that they do not perform any electrical work unless they are qualified and authorized by their supervisor.*		X	
Operator Training and Qualifications – *Employees who operate machines indicate that they have been trained on the hazards of each machine they operate.*		X	
Machine Guarding *Employees who operate machines indicate that they have been trained on the methods to provide guarding on the machines they operate.*		X	
Forklifts – *Employees who operate forklifts indicate that they have been trained to operate each forklift they operate.*		X	
Personal Protective Equipment – *Employees indicate that they are aware of the circumstances in which they must use PPE.*		X	
Respiratory Protection – *Employees who may need to use respirators indicate that they have obtained medical review and approval.*		X	
Employees know who their *Site Safety Advisor* is.			X
Employee Education and Training – *Employees indicate that their training includes the methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area.*		X	
Activity Observation			
Container Labeling Program – Each container of incoming hazardous chemicals is observed to be labeled to indicate the product name, manufacturer's name and address, and any hazard warnings.		X	
Housekeeping – All places of employment are clean and uncluttered.		X	
Means of Egress – *Means of egress are adequate, well-marked, and unobstructed.*		X	

Criteria	Type		
	Essential	Basic	Nice
Electrical Equipment Rating – *All electrical equipment is labeled as having a rating by a nationally recognized testing laboratory such as Underwriters Laboratory (UL) or Factory Mutual (FM).*		X	
Pre-Use Safety Check – *Before using any machine or power tool, operators check to ensure that all parts are installed and in good condition, power cords are undamaged, and guards are properly installed.*		X	
Walking and Working Surfaces are free of obstructions.		X	

Approach:

Documents Review:

- Forklift training records
- Medical plan
- MSDSs
- Master list of hazardous chemicals

Personnel Interview(s):

- Employees, at least three
- Machine operator

Activity Observation:

- Area walk through
- Machine operator demonstration

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