

**U.S. DEPARTMENT OF
COMMERCE**

**OCCUPATIONAL SAFETY AND
HEALTH MANUAL**

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GLOSSARY

ABATE: To eliminate or reduce an unsafe or unhealthful working condition.

ACCIDENT: Any unplanned or unexpected event that results in personal injury, death, occupational illness, damage or loss of equipment or property.

ACCIDENT INVESTIGATION: The investigation of facts surrounding the cause(s) of an accident.

ACCIDENT REPORT: The formal report of an accident investigation.

ACGIH: American Conference of Governmental Industrial Hygienists.

ACTION LEVEL: A specific concentration of a substance which is less than the established PEL. Usually if exposure occurs at or above the action level, certain other criteria must be implemented. Only certain OSHA standards have an action level.

ACUTE: Sudden, severe, short duration.

ACUTE EXPOSURE: A short period of exposure to a substance which results in sudden and severe physiological changes.

ADMINISTRATIVE CONTROL: Any procedure which limits the daily exposure to toxic chemicals or harmful physical agents by control of the work schedule.

AFFECTED EMPLOYEE: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is performed.

AGENCY: An Executive Department, as defined in 5 U.S.C 101, or any employing unit or authority of the government of the United States not within an Executive Department to which the provisions of Executive Order 12196 applies.

ANSI: American National Standards Institute, a national consensus standard-developing organization.

AREA SAFETY REPRESENTATIVE (ASR): The employee designated by a program/site manager at a headquarter's office or major field location to assist the OUSHR and RSM in implementing the Department's Occupational Safety and Health Program.

ATMOSPHERE IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH): Any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health.

AUDIOGRAM: A chart, graph or table resulting from an audiometric test, showing an individual's hearing threshold levels as a function of frequency.

AUDIOMETER: An instrument used to measure hearing sensitivity using pure tones.

AUTHORIZED EMPLOYEE: A person who locks or implements a tagout system procedure on machines or equipment in order to perform the servicing or maintenance on that machine or equipment. An authorized

employee and affected employee may be the same person when the affected employee’s duties also include performing maintenance or service on a machine or equipment.

A-WEIGHTED SOUND LEVEL: Sound level in decibels as measured on a sound level meter using an A-weighted scale. This scale attempts to reflect the human ear's decreased sensitivity to low frequency sounds.

BIOHAZARDOUS AGENTS: include human and non-human blood, blood products, body fluids, organs, body parts and tissue; blood- soiled articles; carcasses and contaminated bedding of animals known to be infected with a disease that may be transmitted to humans; viruses, bacteria, fungi, and parasites; cultures and stocks of infectious agents and associated biologicals, etc.

“CAPABLE OF BEING LOCKED OUT”: An energy-isolating device that is:

- a. Designed with a hasp or other attachment or integral part to which, or through which, a lock can be affixed; or
- b. Equipped with a built-in locking mechanism.

Other energy-isolating devices will also be considered to be capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device, or permanently alter its energy-control capability.

CEILING LIMIT: An exposure limit which cannot be exceeded for any length of time.

CHRONIC: Long duration, repeated (recurrent), persistent.

CHRONIC EXPOSURE: A long-term, repeated exposure to a substance.

COMPETENT PERSON: One who, through training and experience, is capable of identifying and evaluating existing hazards in the workplace and is capable of specifying the necessary protection and precautions to be taken to ensure the safety of employees. This person has the authority to take, prompt corrective measures to eliminate hazards.

CONCENTRATION: The amount of a given substance in a stated unit of measure, such as per-cent by weight or volume, or weight per unit volume.

The following are examples of commonly used concentrations in occupational safety and health:

mg/m3	milligrams per cubic meter	for vapors, gases, fumes,
	and dusts	
PPM	parts per million	for vapors or gases
fibers/cc	fibers per cubic centimeter	for asbestos

CONTAINMENT: is referred to as the safe management of potentially biohazardous agents.

CONTAMINANT: A material or agent not normally present in the atmosphere, e.g., dust, fume, gas, mist or vapor, which can be harmful, irritating or a nuisance. **dB(A)** A sound level reading in decibels as measured on the A weighted scale of a sound level meter. (See A-weighted Sound Level)

DANGER ZONE: Any portion or component of a machine or equipment which would cause serious personal injury or death in the event of contact. Examples are chain drive and sprockets, cutting blade of a shear, in-running nip between two rollers, drive shafts, etc.

DECIBEL-dB: A unit of measurement of sound level.

DECONTAMINATE: is to render contaminated items safe to handle.

DESIGNATED AGENCY SAFETY AND HEALTH OFFICIAL (DASHO): The individual at the Assistant Secretary level who is responsible for the administration of the DOC safety and occupational health program.

DEPARTMENT'S SAFETY AND HEALTH PROGRAM MANAGER: The principal assistant to the Director for Personnel and Civil Rights and responsible for all Occupational Safety and Health Program matters.

DETECTORTUBE: A glass tube, containing several chemicals and an inert material (e.g. silica gel), in which a color producing chemical reaction occurs when contaminated air is drawn through the tube. The length of the color stain is proportional to the concentration of the contaminant being measured.

DISABLING WORK INJURY: Any impairment resulting from an accident or occupational disease which prevents any DOC employee from performing his/her regularly established work during a 24-hour period, or more, subsequent to the day of injury.

DOSIMETER: A device for measuring cumulatively the exposure of an individual over a period of time.

DUST: Small solid particles created by the breaking up of larger particles by processes such as crushing, drilling, grinding, etc. Examples of processes that generate dust: Use of machine shop tools, paint chipping, sanding, woodworking, abrasive blasting.

EMPLOYEE: Any person employed or otherwise permitted or required to work for wages for the Department of Commerce.

EMPLOYMENT RELATED ACCIDENT: An accident occurring as a result of work performance or exposure to the work environment.

ENERGIZED: Connected to an energy source or containing residual or stored energy.

ENERGY-ISOLATING DEVICE: A mechanical device that physically prevents the transmission or release of energy, including, but not limited to, the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a slide gate; a slip blind; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch, or other control circuit type devices.

ENERGY SOURCE: Any source of electrical, hydraulic, chemical, pneumatic, mechanical, thermal, or other energy, including gravity and compressed springs.

FACILITY: A separate, individual building, structure, or other form of real property, including land.

FEDERAL OSHA OFFICIAL: An employee of the Department of Labor, Occupational Safety and Health

Administration (OSHA) with the authority and responsibility for enforcing the occupational safety and health program.

FIRST-AID TREATMENT: Any one-time treatment, or follow-up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, and so forth, which do not usually require medical care. The one-time treatment and follow-up visit for observation is considered first-aid even though provided by a physician or registered professional personnel.

FREQUENCY: The number of sound waves produced per second, or the number of complete oscillations per second of an electromagnetic wave. Frequency is measured in units of Hertz (Hz) where one Hz is equal to one cycle per second. Frequency is related to the subjective sensation of pitch. High frequency sounds (2000, 3000, and 4000 Hz) are perceived as high pitched sounds.

FUME: Very small (10 micrometers diameter or less) solid particles formed by condensation of volatilized solids, usually metals.

GAS: Formless fluid which tends to occupy an entire space uniformly at ordinary temperatures and pressures.

HARMFUL PHYSICAL AGENT: Any physical agent (stress, noise, heat, cold,) which may cause injury to the human body or which is suspected of being able to cause diseases or injury under some conditions.

HAZARD: A workplace condition that might result in injury, health impairment, illness, disease, or death to any worker who is exposed to the condition, or damage or loss to property/equipment.

HAZARD CONTROL ASSESSMENT: An objective overall assessment for measuring the relative priority of hazard abatement projects.

HAZARD, SERIOUS: A workplace condition of Category I or Category II, as defined below:

- (1) Category I - Catastrophic: The hazard may cause death or loss of a facility.
- (2) Category II - Critical: May cause severe injury, severe occupational illness, or major property damage.
- (3) Category III - Marginal: May cause minor injury, minor occupational illness or damage.
- (4) Category IV - Negligible: Probably would not affect the safety or health of the personnel, but is in violation of specific criteria.

HAZARDOUS MATERIAL: A hazardous material is a product or material that is flammable, reactive, radioactive, or toxic and whose presence or use constitutes a physical, chemical, or biological hazard.

HAZARDOUS MATERIAL: For the purpose of preparing the Material Safety Data Sheet, a hazardous material is defined as a material having one or more of the following characteristics:

- a. Has a flashpoint below 200OF (93.30C) closed cup, or is subject to spontaneous heating or is subject to polymerization with release of large amounts of energy when handled, stored and shipped without adequate control,

- b. Has a threshold limit value (TLV) below 1000 parts per million (PPM) for gases and vapors, below 500 mg/m³ for fumes, and below 30 mppcf for dusts,
- c. A single oral dose which will cause 50% fatalities to test animals when administered in doses less than 500 mg per kilogram of test animal weight,
- d. Is a strong oxidizing or reducing agent,
- e. Causes first degree burns to skin in short time exposure, or is systemically toxic by skin contact;
- f. In the course of normal operations, may produce dusts, gases, fumes, vapors, mists or smokes with one or more of the above characteristics,
- g. Produces sensitizing or irritating effects,
- h. Is radioactive, or
- i. The item has special characteristics which, in the opinion of the manufacturer, could cause harm to personnel if used or stored improperly.

HAZARDOUS MATERIAL INFORMATION SYSTEM: (HMIS) A computer based information system developed to accumulate, maintain, and disseminate important characteristics of hazardous materials which exist throughout the Department of Defense (DOD).

HAZARDOUS NOISE: Exposure to an 8-hour time-weighted average sound level of greater than 85 Db(A) or intermittent, impact, impulse noise levels of greater than 140 Db(A).

HAZARDOUS NOISE AREA: Any work area where the A-weighted sound level (continuous or intermittent) is equal to or greater than 85 Db. or where the peak sound pressure level (impulse or impact noise) exceeds 140 Db.

HEARING LEVEL: The amount in decibels (Db) by which the threshold of audition for an ear differs from zero decibels (a standard audiometric threshold derived from normal-hearing young adults), for each frequency.

HERTZ (Hz): The unit of measurement of frequency, numerically equal to cycles per second.

HIGH-EFFICIENCY PARTICULATE AIR (HEPA) FILTER: A filter capable of trapping and retaining at least 99.97 percent of 0.3 micrometer diameter monodispersed particles.

ILLNESS (OCCUPATIONAL): Any abnormal condition or disorder of the body, other than one resulting from an injury, caused by exposure to conditions associated with the occupational environment.

IMMINENT DANGER: A condition that immediately threatens an employee with loss of life, serious injury or illness.

IMPULSE OR IMPACT NOISE: Sound of a short duration, usually less than one second, with an abrupt onset and rapid decay. Also those variations in noise levels that involve maxima at intervals greater than 500 milliseconds. Where the intervals are less than 500 milliseconds, the noise is considered continuous.

INJURY: Traumatic bodily harm, such as a cut, fracture, burn or poisoning, caused by a single or one-day exposure to an external force, toxic substance or physical agent.

INFECTIOUS: defined as capable of causing infection or being communicable by infection.

INSPECTION: A comprehensive survey of all or part of a workplace in order to detect safety and health hazards.

INSTALLATION: A facility or grouping of facilities located in the same vicinity, which support particular DOC functions. Installations may include locations such as airports, shipyards, office buildings, laboratories, etc., or may be ships.

LOCKOUT: The placement of a lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

LOCKOUT DEVICE: A device that uses a positive means such as a lock, either key or combination type, to hold an energy-isolating device in the safe position and prevent the energizing of machines or equipment.

MULTIPLE LOCKOUT/TAGOUT DEVICE: A device designed to accept two or more locks or Equipment Tagout Tags, and is placed on the energy-isolating device to hold it in the safe position. This device is used when more than one person is working on the machine or equipment, and cannot be removed from the energy-isolating device until all locks or tags are removed.

LOST WORK DAYS - DAYS AWAY FROM WORK: The number of days (consecutive or not) that a DOC employee would have worked but could not because of an occupational injury or illness. This category is limited to days lost as a result of an on-duty occupational illness or injury. The number of lost work days does not include the day of the injury or any days which the person was not scheduled to work, e.g. Saturdays, Sundays and holidays.

MATERIAL SAFETY DATA SHEET (MSDS): The form (OSHA Form 20 or equivalent) used to display important characteristics of a particular hazardous material.

MEDICAL TREATMENT: Treatment administered by a physician or by registered personnel under the standing orders of a physician. Medical treatment does not include first aid even though provided by a physician or registered professional personnel.

MSHA: Mine Safety and Health Administration, U.S. Department of Labor.

MIST: Finely divided liquid droplets suspended in air and generated by condensation or by atomization.

NIOSH: National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services.

NIOSH/MSHA CERTIFIED EQUIPMENT: Respirators or other equipment that have been tested by NIOSH or MSHA and jointly approved as meeting certain minimum requirements of protection against specified hazards.

NOISE EXPOSURE: Personal interaction to a combination of sound level and its duration.

NORMAL PRODUCTION OPERATIONS: The use of a machine or equipment to perform its intended production function.

NORMAL WORKING POPULATION EXPOSED TO HAZARD: The number of employees whose activities on DOC owned or leased property cause them to be exposed to the hazardous condition on several occasions during a work year; no one should be included in this estimate who is exposed to the hazard so infrequently or at such low exposure concentrations that it can be considered insignificant. For example, do not count as exposed those employees who only occasionally pass by the door where a hazard is located.

OCCUPATIONAL HEALTH: The field of general preventive medicine concerned with the prevention and/or treatment of illness induced by factors in the workplace environment. The major disciplines are: occupational medicine, occupational health nursing, epidemiology, toxicology, industrial hygiene, and health physics.

OPERATING UNITS: Bureaus, agencies, administrations, and offices which report directly to the Secretary of Commerce.

MOTOR VEHICLE: Any self-propelled mechanically or electrically powered vehicle designed to be operated principally on the highway for the transportation of property or passengers.

MOTOR VEHICLE ACCIDENT: Any occurrence involving a Federal Government owned, leased or rented motor vehicle, or privately owned motor vehicle operated on official business, which results in the death, injury or property damage of \$100 or more, regardless of who was injured (if anyone) or what property was damaged.

NON-VEHICLE PROPERTY DAMAGE ACCIDENT: Any accident, other than motor vehicle, which involves Federal property or relates to Federal operations anywhere; and which results in property damage exceeding \$100. Accidents involving special purpose vehicles used primarily off public highways, and properly parked motor vehicles, are recordable as special purpose vehicle property damage accidents.

OPERATING UNIT SAFETY AND HEALTH REPRESENTATIVE (OUSHR): The employee designated or appointed by the head of an operating unit to be responsible for implementing the Department's Occupational Safety and Health Program within the operating unit.

OSHA: Occupational Safety and Health Administration, U.S. Department of Labor.

OSHAct: The Williams-Steiger Occupational Safety and Health Act of 1970, Public Law 91-596, December 29, 1970.

OSHA STANDARDS: Standards issued by the U.S. Department of Labor Occupational Safety and Health Administration pursuant to Section 6 of the OSHAct.

OXYGEN DEFICIENT ATMOSPHERE: An atmosphere having an oxygen concentration which is below the minimum legal requirement (19.5 percent), but above that which is immediately dangerous to life and health. Such a deficiency is generally caused by oxidation or by the dilution/displacement of oxygen by other gases.

PARTICULATE MATTER: A suspension of fine solid or liquid particles in air, such as: dust, fog, fume, mist, smoke or spray. Particulate matter suspended in air is commonly known as an aerosol.

PEL: Permissible Exposure Limit. The maximum possible concentration of a toxic chemical or physical agent, to which the employee may be exposed.

PERSONAL PROTECTIVE EQUIPMENT: Any protective device or clothing worn, used or put in place for the safety and protection of an employee during the performance of work assignments. Examples of personal protective equipment include coveralls, hard hats, gloves, safety shoes, ear muffs/plugs, and respirators.

PROTECTIVE EQUIPMENT: A device or item put in place for the protection of employees or the public at large. Examples of protective equipment include barricades and lights.

RECORDABLE OCCUPATIONAL INJURIES OR ILLNESSES: Any occupational injuries or illnesses which result in:

- a. A fatality, regardless of the time between the injury and death, or the length of the illness; or
- b. Injury or illness cases that result in lost work days; or
- c. Non-fatal cases without lost work days which result in transfer to another job or termination of employment, or requires medical treatment (other than first-aid), or involves the loss of consciousness or restriction of work or motion. This category also includes any diagnosed occupational illness which are reported to the employer but are not classified as fatalities or lost work day cases.

REGIONAL SAFETY MANAGER (RSM): The safety and health professional designated or appointed by an Administrative Support Center (ASC) Director to implement the Department's Occupational Safety and Health Program throughout the ASC service area.

REGULATED (ASBESTOS) AREA: A demarcated area established by the site manager to minimize the number of persons who might be exposed to airborne concentrations of asbestos fibers which exceed or can be expected to exceed the permissible exposure limit, threshold limit value or other accepted exposure limit.

RESTRICTED AREA: Any area where access is controlled for the purpose of excluding entry of persons of less than 140 centimeters (55 inches) in stature.

RISK ASSESSMENT CODE (RAC): A simple expression of risk which combines the elements of hazard severity and mishap probability. This assessment will be used to help prioritize abatement projects.

SAFETY OR HEALTH PROFESSIONAL: Persons who meet the Office of Personnel Management standards for Safety and Occupational Health Specialist Manager GS0018, Safety Engineer GS0803, Safety Technician GS001-9, Fire Protection Engineer GS0804, Fire Protection Specialist/Marshall GS0081, Medical Officer GS0602, Health Physicist GS1306, Industrial Hygienist GS0690, or Occupational Health Nurse GS0610.

SERIOUS PHYSICAL HARM: Permanent, prolonged, or temporary impairment of the body in which part of the body is made functionally useless or is substantially reduced in efficiency on or off the job. Examples of inhibiting illnesses are silicosis, asbestosis, hearing impairment, radiation exposure and visual impairment.

SERVICING AND/OR MAINTENANCE: Workplace activities such as construction, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start-up of the equipment or release of hazardous energy.

SETTING UP: Any work performed to prepare a machine or equipment to perform its normal production

operation.

SIGNIFICANT THRESHOLD SHIFT: A change in the hearing threshold level relative to the baseline (reference) threshold level of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

SMOKE: Carbon or soot particles less than 0.1 micrometer in size resulting from the incomplete combustion of carbonaceous materials such as coal or oil.

SOLVENT: A substance, most commonly water, but often an organic compound which is used to dissolve another substance.

SPECIAL PURPOSE VEHICLE: Any self-powered mechanically or electronically powered agricultural, construction, warehouse, material handling or other special purpose vehicle used primarily off public highways by Federal employees during the official workday. Examples include cranes, lifts, watercraft and aircraft. Accidents involving damage to motor vehicles while properly parked are included in this category.

STANDARD: A rule, established by a competent authority, which designates safe and healthful conditions or practices under which work must be performed in order to prevent injury, occupational illness or property damage.

a. Criteria Those parts of a standard that establish a measurable quality, e.g., specifications, inspection intervals, etc., which must be met.

b. Equivalent Criteria A criteria which is determined to be equivalent ("at least as effective as") to the originally established criteria which it supersedes. The determination of equivalency must be made by a competent authority and shall be a judgement based on the preponderance of information available.

STEL: (Short Term Exposure Limit) A 15-minute time weighted average exposure which should not be exceeded at any time during a workday.

SUPERVISOR: One who immediately directs the job efforts of a working group or individual.

TAGOUT: The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled cannot be operated until the tagout device is removed.

TAGOUT DEVICE: A prominent warning device, such as a commercially available tagout tag and a means of attachment, which can be securely fastened to an energy-isolating device in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled cannot be operated until the tagout device is removed.

TLV: (Threshold Limit Value) A term used to express the airborne concentration of a substances to which most workers may be repeatedly exposed, day after day, without an adverse effect. TLVs are established by the American Conference of Governmental Industrial Hygienists (ACGIH) and are recommendations and should be used as guidelines in establishing good practices.

TOXIC SUBSTANCE: Any substance, which can cause acute or chronic injury to the human body, or which is suspected of being able to cause diseases or injury under some conditions.

TRAUMATIC INJURY: A wound or other condition of the body, caused by external force, including strain

or stress. The injury must be identifiable as to time and place of occurrence and member or function of the body affected and be caused by a specific event or incident or series of events or incidents within a single day or work shift.

TWA: Time Weighted Average. An average value weighted in terms of the actual time it exists during a given time interval.

VAPOR: Gaseous form of substances which are normally in a solid or liquid state and which can be changed to these states either by increasing the pressure or decreasing the temperature.

WORKING DAYS: Authorized days of work, normally Monday through Friday (excluding Federal holidays), or other designated days.

WORK PLACE: A place of employment (usually a single geographical location) where employees perform authorized duties in designated work areas.

WORK ENVIRONMENT: The physical location, equipment, materials processed or used, and the kinds of operations performed by an employee in the performance of his/her work, whether on or off the Department's premises.

CHAPTER 1

INTRODUCTION

01. BACKGROUND

9. The Department of Commerce (DOC) Occupational Safety and Health (OSH) Program has existed for several years. Historically, management of the occupational safety program component has been delegated to each DOC Operating Unit Head, whereas the occupational health component had been centrally managed by the Department's Director of Personnel.
- b. The OSH Program gained special prominence after the passage of the Occupational Safety and Health Act (the Act) on December 31, 1970, although the primary thrust of the Act was directed at the private sector employer. Section 19 of the Act directed Federal agencies to establish and maintain comprehensive and effective occupational safety and health programs consistent with the standards promulgated under Section 6 of the Act.
- c. On July 26, 1971, Presidential Executive Order (E.O.) 11612, entitled "Occupational Safety and Health Programs for Federal Employees" was signed. This Executive Order stated that the Federal government, as the nation's largest employer, has a special obligation to set an example for safe and healthful employment. In this regard, the head of each Federal department and agency was directed to establish an occupational safety and health program in compliance with Section 19 of the Act. Over the next three years, only moderate progress was made by many Federal agencies; consequently, the Congress received considerable criticism for a perceived double standard between the private sector and Federal agencies. As a result, E.O. 11807 was issued in 1974 to replace E.O. 11612 and more clearly define the scope, requirements and responsibilities of Federal agency programs. In addition, E.O. 11807 tasked the Secretary of Labor to issue guidelines designed to assist Federal agencies in establishing their programs. The guidelines were issued on October 9, 1974, as Title 29, Code of Federal Regulations, Part 1960, "Safety and Health Provisions for Federal Employees."
- d. As a result of questions raised concerning the regulatory authority of the Department of Labor (DOL) to issue such "guidelines," E.O. 11807 was superseded on February 26, 1980 by E.O. 12196, "Occupational Safety and Health Programs for Federal Employees." This Executive Order *requires* each agency head to *comply with all standards* issued under Section 6 of the Act, except where the Secretary approves compliance with alternative standards.

This was a major change which affected all Federal agencies and, in turn, resulted in DOL revising its "guidelines" on October 23, 1980, and reissuing them as "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters."

02. U.S. DEPARTMENT OF COMMERCE SAFETY AND HEALTH POLICY

It is DOC policy to provide safe and healthful work environments for all employees. These conditions shall be ensured through a comprehensive and effective program fully endorsed by the

Secretary of Commerce and implemented throughout the Department. The program shall include the following:

- a. Compliance with applicable standards.
- b. At least annual inspections of all work places by qualified OSH inspectors.
- c. Prompt abatement of identified hazards. To the greatest extent possible, all hazards shall be eliminated or minimized through engineering or administrative controls. Where engineering or administrative controls are not achievable, appropriate personal protective equipment shall be provided at government expense. Where hazard resources are limited, priorities shall be assigned to correct the most serious problems first. Notices shall be posted to warn employees of unabated serious hazards and to provide interim protective measures.
- d. Procedures for all employees to report suspected hazards to their supervisors and/or safety and health officials without fear of reprisal. Allegations of reprisal for such participation shall be filed within existing reporting channels. Nothing, however, shall prohibit the employee from notifying the next higher level safety and health official if appropriate abatement has not occurred.
- e. Appropriate OSH training for safety and health officials, all supervisory personnel and employees. Applicable OSH requirements shall be integrated into training programs and technical publications.
- f. Procedures for the review, in advance of procurement or construction, of facility, system and subsystem design to ensure that OSH hazards are eliminated or controlled throughout the life cycle.
- g. A thorough accident investigation process and a comprehensive OSH management information system which provides all OSH data required by upper management.

03. APPLICABILITY

The provisions of this manual apply to all DOC employees and shall be consistent with the provisions of 5 U.S.C., Sections 7901-7902 and other provisions of law providing for collective bargaining agreements and procedures.

CHAPTER 2

RESPONSIBILITIES

01. DISCUSSION

- a. The Secretary of Commerce fully supports the concept that a successful occupational safety and health program, one which truly reduces work-related risks, results when the visibility of the program penetrates every level of the organization. In support of this, the Secretary has established the maintenance of a safe and healthful work place as a top management policy within the Department. Overall responsibility for the Department of Commerce Occupational Safety and Health Program (OSH Program) rests with the Secretary of Commerce with implementation authority delegated to the Chief Financial Officer and Assistant Secretary for Administration.
- b. This Chapter describes the responsibilities at each level for implementing the OSH Program.

02. DESIGNATED AGENCY SAFETY AND HEALTH OFFICIAL (DASHO)

As Designated Safety and Health Official (DASHO), the Director for the Office of Administrative Services is responsible for the overall administration of the OSH Program, and shall:

- a. Be accountable for all OSH Program activities, including compliance with Federal regulations;
- b. Manage the development, issuance, and maintenance of the Department of Commerce Occupational Safety and Health Manual (OSH Manual) authorized in Section 4 of DAO-209-4;
- c. Ensure that periodic evaluations are conducted of the effectiveness of the OSH Program; and
- d. Chair the Department's Occupational Safety and Health Council.

03. DEPARTMENT SAFETY AND HEALTH PROGRAM MANAGER

The Department Safety and Health Program Manager, as a principal assistant to the Director for the Office of Administrative Services, shall:

- a. Oversee all OSH Program activities including evaluation of the Program's effectiveness and compliance with Federal and Departmental requirements;
- b. Develop policy, guidance and standards for the Department's OSH Program;
- c. Ensure health services are provided to Department employees and such services are administered in an effective manner. This includes:
 - 1. Evaluating the level of health service provided ("level" includes the extent of treatment capability at a facility in terms of available medical skill, equipment, and staff);
 - 2. Making recommendations to improve the service level; and
 - 3. Developing policy consistent with OPM and DOC requirements.

- d. Prepare the annual Occupational Safety and Health Report for submission to the Secretary of Labor, and
- e. Develop, issue, and maintain the Department's OSH Manual, addressed in Section 4 of DAO 209-4.

04. OPERATING UNITS

- a. HEADS OF OPERATING UNITS are responsible for providing a safe and healthful work place for their employees and for ensuring implementation of the OSH Program within their units. Each operating unit head shall designate an Operating Unit Safety and Health Representative (OUSHR) and re-delegate to this employee the authority to implement the OSH Program within the unit. Operating units which meet any of the following criteria shall have a full time OUSHR who meets OPM standards for Safety and Health Manager/Specialist, GS-0018; Safety Engineer, GS-0803 or Industrial Hygienist, GS-0690:

- 1. The number of employees in the operating unit exceeds 2500;
- 2. The employees of the operating unit work in a medium to high risk environment (e.g., research laboratories).
- 3. The operating unit experiences fifty or more occupational accidents per year for two consecutive fiscal years.

Heads of operating units whose organizations do not meet any of the above criteria shall assign these functional responsibilities as a collateral duty to an appropriate individual within the organization.

- b. Management Officials, at the request of and in consultation with the OUSHR, will designate qualified employees to serve as Area Safety Representatives (ASRs). The designated employee may have other assigned duties at the discretion of the designating official.

- c. Operating Unit Safety and Health Representatives (OUSHR) shall:

- 1. In consultation with program and site managers, establish and maintain a network of Area Safety Representatives (ASRs):
- 2. Coordinate with ASRs and ASC Regional Safety Managers (RSMs) to ensure annual inspection of all work places;
- 3. Coordinate with appropriate Department management, ASRs, and RSMs to ensure abatement of unsafe or unhealthful working conditions.
- 4. Maintain record keeping system consistent with Department and OSHA requirements, and make reports as requested;
- 5. Coordinate with ASRs and RSMs to ensure that employees and managers are aware of their safety and health responsibilities, and assist them in meeting those responsibilities;
- 6. Participate as a permanent member of the Department's Occupational Safety and Health Council;

7. As necessary, develop and issue operating unit policies and procedures to supplement the Department's OSH Program;
 8. Provide required reports to the Department on the status of the operating unit's OSH Program within headquarter's offices.
- d. Area Safety Representatives (ASRs), within their designated areas of responsibility, shall:
1. Conduct inspections of all work places in accordance with 29 CFR Part 1960, Subpart D. Documentation of completed inspections shall be provided to the appropriate RSM and OUSHR in a timely manner;
 2. Coordinate with appropriate management officials and building maintenance personnel to correct unsafe or unhealthful working conditions;
 3. Maintain records and submit reports as requested to the appropriate OUSHR/RSM to support the OSH Program;
 4. Inform managers and employees of their safety responsibilities, and assist them in meeting those responsibilities; and
 5. As required, obtain technical assistance from the RSM or OUSHR to aid in the evaluation and inspection of work environments.

05. ADMINISTRATIVE SUPPORT CENTERS

- a. Each ASC Director is responsible for assisting managers at Department installations serviced by the ASC in establishing a safe and healthful work environment and ensuring full implementation of the OSH Program at these facilities. The Director shall designate an ASC Regional Safety Manager (RSM) who meets OPM standards for a Safety and Health Manager/Specialist, GS-0018; Safety Engineer, GS-0803; or Industrial Hygienist, GS-0690, and delegate to this individual the necessary authority to execute these responsibilities.
- b. Regional Safety Managers (RSMs) shall:
 1. Monitor implementation of the OSH Program at field installations;
 2. Coordinate with ASRs and OUSHRs on the inspection of all work sites within the ASC service area;
 3. Provide assistance to the ASRs for the effective implementation of the OSH Program;
 4. Conduct inspections of medium and high risk workplaces at least every three years, and report as directed;
 5. Maintain a computer-based records keeping system consistent with Department and OSHA regulations;
 6. Provide reports as required by the Safety and Health Program Manager on the status of the Program within the ASC service area;

7. Maintain copies of the Occupational Safety and Health Act of 1970, Executive Order 12196, applicable OSHA regulations contained in 29 CFR, Department Organization Orders, and Department Administrative Orders pertaining to the Program. Copies of any of these sources shall be made available to any Department employee upon request;
8. Provide technical guidance to ASC Reality Specialists in acquiring real property which meets occupational safety and health requirements;
9. Review modifications to equipment or buildings for compliance with occupational safety and health regulations;
10. Coordinate or provide training to ASRs, supervisors, and employees serviced by the ASC as required by the Program;
- Provide assistant to site managers in establishing health services for employees at field installations; and,
12. Participate as a permanent member of the Department's Safety and Health Council.

06. SUPERVISORS (throughout the Department shall):

- a. Ensure that their employees comply with Department occupational safety and health standards, regulations, and applicable directives;
- b. Provide a place of employment which is free from recognized hazards;
- c. Initiate proper action to correct hazards and ensure compliance with safety practices;
- d. Ensure prompt investigation and reporting of all accidents involving their employees and all accidents occurring in work areas under their jurisdiction; and
- e. Where required, provide approved protective equipment to employees and ensure its proper use.

07. EMPLOYEES (throughout the Department):

- a. Shall comply with the Department occupational safety and health standards, regulations and orders applicable to their individual actions and conduct.
- b. Shall report unsafe or unhealthful conditions and practices to their supervisor or area safety representative and, if appropriate, request an inspection of the workplace;
- c. Where required, shall wear and properly maintain personal protective clothing and equipment; and
- d. Each employee has the right:
 1. To disclose information which he or she reasonably believes evidences a substantial and specific danger to public health or safety to the Inspector General of the Department; and
 2. To make the disclosure anonymously and be protected from reprisal because of any such disclosure.

CHAPTER 3

OCCUPATIONAL SAFETY AND HEALTH STANDARDS

01. DISCUSSION

- a. Heads of Federal agencies are required to establish procedures for the development of agency OSH standards. Agencies are required to comply with the standards promulgated for the private sector by the Secretary of Labor, pursuant to Section 6 of the Act.
- b. The Department of Commerce has adopted the Occupational Safety and Health Administration (OSHA) standards for use throughout the Department. In addition, DOC has adopted several supplemental standards and other regulatory OSH standards. These are addressed in Section 02. below. More stringent alternate procedures to the OSHA standards may be adopted by operating units following approval procedures addressed in Section 03. of this chapter.
- c. This chapter provides guidance and direction in the development and application of standards within the DOC OSH program.

02. DOC OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Department of Commerce Occupational Safety and Health standards shall consist of the following:

- a. DOC operating procedures (corresponding to chapters in this manual). These procedures will be based on the following:
 - 1. OSHA standards, including emergency temporary standards issued under the provisions of the OSH Act. Instructions based on these standards may simply refer to a specific OSHA standard (e.g. 29 CFR 1910.95) or may paraphrase, transpose or otherwise adopt the standard without altering the basic criteria unless the alteration applies a more stringent criteria (e.g., lower exposure limits, increased monitoring frequency, etc.). The instruction may also refer to or adopt the latest version of an OSHA reference standard;
 - 2. Alternate DOC standards, authorized by the Department Safety and Health Program Manager subject to Department of Labor approval;
 - 3. Supplementary OSH standards covering conditions in unique work places for which no OSHA standards exist;
 - 4. Other regulatory OSH standards, issued under the statutory authority by Federal agencies such as the Departments of Transportation and Energy, the Nuclear Regulatory Commission (NRC), the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), the Federal Aviation Administration (FAA), and the Coast Guard (CG); or
 - 5. Special standards, rules, and regulations developed by DOC or operating units to govern on site safety and health to the unique operations, equipment, and systems.

If there is no applicable DOC operating procedure (such as a chapter in this manual or an operating unit procedure), then check for:

- b. Published OSHA standards. If there is no published OSHA standard, then

- c. Any nationally recognized source of OSH guidance such as the American Conference of Governmental Industrial Hygienists (ACGIH), the American National Standards Institute (ANSI), the National Fire Protection Association (NFPA), and the National Institute for Occupational Safety and Health (NIOSH) criteria documents.

A partial listing of current standards that apply to DOC operations below:

- 29 CFR 1910 General Industry Standards,
- 29 CFR 1915 Shipyard Industry,
- 29 CFR 1917 Marine Terminal Operations,
- 29 CFR 1918 Longshoring Industry Standards,
- 29 CFR 1926 Construction Industry Standards,
- EPA Resource Conservation and Recovery Act,
- EPA Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),
- Department of Energy and the Nuclear Regulatory Commission regulations concerning the licensing, use, storage and disposal of radioactive material, and,
- Department of Transportation regulations regarding the marking, and transportation of hazardous materials.

The Department of Commerce has not deemed it necessary to create similar standards and; therefore, is obligated to comply with the above regulations as they are written. When a conflict between Federal, State and/or local standards arises, the most stringent standard will apply.

03. ALTERNATE STANDARD APPROVAL

The head of an operating unit must determine whether modifications to a DOC OSH standard are appropriate for the operating unit. Any proposed alternate standard must provide protection at least equivalent to that afforded by the DOC OSH standard being replaced. The following procedure applies:

- a. The Operating Unit Safety and Health Representative (OUSHR) will circulate proposed alternate standard to ASC Regional Safety Managers (RSMs) and employee organizations for comment.
- b. Subsequent to the comment period, the proposal shall be submitted by the operating unit head to the Department Safety and Health Program Manager for approval. The proposal must be accompanied by: (1) a summary statement which delineates the differences between the applicable DOC OSH standard and the proposed alternate standard, (2) a justification for the change, and (3) a summary of comments received.
- c. Upon receipt of Department approval, the operating unit head will ensure copies of the alternate standard are provided to the line organizations and the RSMs for implementation at all affected facilities.

04. APPLICATION

DOC OSH standards shall be applied in all DOC activities throughout the continental United States, Hawaii, and Alaska. Foreign Commercial Service and operating unit employees serving at overseas posts shall be guided by the Department of State OSH program and applicable standards.

- a. Certain operations are subject to mandatory safety standards or rules which are derived from separate statutory authority e.g., EPA regulations relating to hazardous materials “generators” or treatment/disposal facilities (TSDF’s). Provided there is no substantive conflict, the application of these special functional standards does not exempt any workplace from other DOC OSH standards which address conditions not specifically covered by the special rules.

For example, a laboratory is subject to EPA standards and is also subject to DOC OSH standards for personal protective equipment, hazard communication, etc.

- b. Where employees of different DOC operating units and other Federal agencies are collocated in the same Federal installation, the DOC manager in charge should consult with the other agencies to resolve conflicts or potential conflicts in OSH standards.

05. IMPLEMENTATION

All levels of management shall:

- a. Ensure criteria contained in DOC OSH standards are:
 - 1. Understood and complied with by any affected employee, and enforced by supervision. In cases of non-compliance, management should take disciplinary action as a corrective measure against the offender and the supervisor, as appropriate;
 - 2. Applied in the acquisition of goods and services, and during the design and construction stages of new or upgraded facilities;
- b. Ensure that all publications, instructions, manuals, specifications, technical orders, etc., which contain OSH provisions, are reviewed and updated to conform to DOC OSH standards in a timely manner.

06. STANDARDS REVIEW

The Department of Commerce will review proposed OSHA standards and NIOSH criteria documents. The priority for reviewing these documents shall be based on the potential impact of each standard on DOC's overall mission and activities. In instances where a particular DOC operating unit possesses special expertise or interest in a proposed standard, that operating unit may be assigned the review responsibility. DOC review of standards or criteria documents will be coordinated by the Department's Safety and Health Program Manager and will include:

- a. Establishing a priority of OSHA standards or NIOSH criteria documents for review;
- b. Identification of operating units, centers, laboratories, etc., which should participate in the review process; and
- c. Determine applicability and impact of proposed standards and/or criteria under review.

CHAPTER 4

COUNCILS AND COMMITTEES

01. DISCUSSION

- a. Occupational Safety and Health (OSH) Councils and Committees serve as sounding boards for multiple viewpoints and interests of various groups and individuals on matters relating to the Department's OSH program. It is their purpose to serve as functioning bodies in the DOC OSH program by identifying, defining, and assessing OSH problem areas, and by recommending corrective measures for policy discrepancies where they may exist. From these recommendations, new or revised policies and procedures may be developed. Actions can then be initiated to first, improve the effectiveness of the Department's OSH program, and second, to meet specific needs of the individuals, groups and activities individually and collectively.
- b. OSH councils and committees have three basic functions:
 - 1. Create and maintain an active interest in occupational safety and health;
 - 2. Serve as a means of communications regarding occupational safety and health; and
 - 3. Provide program management assistance, including proposing policy and program objectives.

02. OCCUPATIONAL SAFETY AND HEALTH COUNCILS AND COMMITTEES

- a. The Federal Advisory Council on Occupational Safety and Health (FACOSH) acts in an advisory capacity to assist the Secretary of Labor in carrying out program responsibilities. The council consists of sixteen members appointed by the Secretary and includes representatives from Federal agencies and labor organizations representing Federal employees. At least eight members shall be representatives of such labor organizations.
- b. Field Federal Safety and Health Councils sponsored by OSHA have been established in many major metropolitan areas. The councils are established to facilitate the exchange of ideas and information about occupational safety and health throughout the Federal Government. While FACOSH was originated to operate at the headquarters level, the field councils function at the local level. These councils consist of representatives from local Federal agencies and labor organizations representing Federal employees.

The Department of Commerce supports these councils, and local Commerce officials are urged to participate in their activities.

- c. The Department opted not to establish an occupational safety and health committee that conforms to the provisions of Executive Order 12196 and 29 CFR 1960. Instead, the DOC Safety and Health Council was established under provisions outlined in this chapter. This council is chaired by the Designated Agency Safety and Health Official and includes representatives from all operating units and ASCs.
- d. In operating unit field locations and at each ASC, OSH councils/committees may be established if

considered necessary or desirable. This determination will be based upon the size, organization and need of such an activity. When a council is formed:

1. Members shall be appointed by operating unit heads, and shall include ASR's, key supervisory employees and a representative from each local labor unions. Where no union exists, a representative of the employees will be designated.
2. Meetings shall be held quarterly and minutes of the meeting shall be maintained by the ASR, RSM, or OUSHR as applicable.
3. Each council will develop its own rules of operation, agenda, and action items.
4. Operating unit field locations are encouraged to organize OSH committees at the shop level. When such sub-level committees are formed, provisions shall be made for the raising of concerns and recommendations to the next higher level OSH council (if appropriate).

03. FEDERAL SAFETY AND HEALTH CONFERENCES

DOC employees shall be encouraged to participate in existing field Federal Safety Council activities and shall not be penalized for their participation. Attendance and participation by Commerce OSH personnel in regional and national OSH conferences is encouraged. Where field Federal Safety Councils sponsor regular OSH seminars, workshops, and safety training, site managers should consider the benefits to be derived from attendance by collateral duty safety personnel.

04. SAFETY AND HEALTH COUNCILS AND COMMITTEES ABOARD SHIPS

- a. Safety and health councils or committees may be formed aboard any vessel and are encouraged to do so when the ship's total crew numbers more than thirty.
- b. Where formed, it is required that:
 1. The appropriate marine center be informed prior to its formation.
 2. The executive officer of the vessel be a permanent member of the council or committee.
 3. There be equal representation by the crew, officers and union representatives.
 4. Meetings be held quarterly and minutes of the meeting be maintained by the ASR.
- c. Training for the vessels council or committee members should be coordinated through the appropriate ASC RSM.

CHAPTER 5

PREVENTION AND CONTROL OF WORKPLACE HAZARDS

01. DISCUSSION

Section 19(a) of the Occupational Safety and Health Act of 1970 (the Act) requires that all Federal employees be provided with a safe and healthful place of employment. To fulfill this requirement, the Department's Safety and Health Program Manager has been delegated the authority to establish and maintain an effective hazard control program. Hazardous conditions may be identified at the project planning and design stage, as a result of workplace inspections, or by employee reports. All recognized safety and health hazards shall be eliminated or controlled as quickly as possible, subject to priorities based on the degree of risk posed by the hazards. The preferred method of hazard abatement shall be through application of engineering controls or by substitution of less hazardous processes or materials. The use of administrative controls, possibly in conjunction with personal protective equipment, is the next preferred method. Total reliance on personal protective equipment is acceptable only when all other methods are proven to be technically and/or economically infeasible. This chapter discusses the basic principles of hazard control and assigns responsibility for implementing hazard abatement actions.

02. PRINCIPLES OF HAZARD CONTROL

Safety professionals and industrial hygienists are specialists, who, through training and experience, develop proficiency in the recognition, evaluation, and control of workplace hazards. They should be thoroughly familiar with potential hazards created by various materials, equipment, and operations used in DOC facilities, and be aware of special designs required by OSHA and DOC standards to mitigate certain hazards. Some of the principles that are applied to prevent or mitigate workplace hazards are discussed in the following sections.

- a. Substitution. The risk of injury or illness may be reduced by replacement of an existing (or intended) process, material, or equipment with a similar item having a more limited hazard potential. Examples of beneficial process changes include brush painting instead of spray painting to reduce inhalation hazards, and welding instead of riveting to reduce noise levels. Equipment changes might include the use of electric motors rather than internal combustion engines for indoor operation to eliminate potential carbon monoxide exposures, and use of safety cans in place of bottles to store flammable solvents in a manner presenting a lessened fire hazard. Examples of material substitution include switching from carbon tetrachloride to 1,1,1 trichloroethane (methyl chloroform) for solvent degreasing to reduce risk of injury to the liver and kidneys of exposed workers, and the replacement of sand with synthetic abrasives in abrasive blasting cabinets to minimize the silicosis hazard associated with exposure to free silica dust. Care must be exercised in any substitution to ensure that the substitute materials are technically acceptable and to avoid introducing a new or unforeseen hazard.
- b. Isolation. Hazards are controlled by isolation whenever an appropriate barrier or limiter is placed between the hazard and the individual who may be affected by the hazard. This isolation can be in the form of physical barriers, time separation, or distance. Examples include machine guards, electrical insulation, acoustical containment, semi-automatic equipment that does not require constant attendance (time separation), and remote controlled equipment. To ensure that appropriate hazard control techniques are applied, cognizant industrial hygienists and safety professionals shall participate in the review of plans and specifications for these projects. Recommendations should be submitted in writing. Projects that involve potential health hazards such as toxic materials, radiation,

noise, or other health hazards shall be designed in accordance with established principles of good industrial hygiene such as those published by OSHA, NIOSH, ANSI, and ACGIH.

- c. **Operating Procedures.** Standard operating procedures or similar directives that specify the manner in which work is performed shall include appropriate safety and health requirements. Integration of instructions that affect productivity with those that effect well-being of employees is necessary to achieve organization goals in both areas with minimal conflict or confusion. Originators of such directives to work with potential hazards should coordinate with the appropriate safety and health personnel prior to issuance to ensure that applicable DOC requirements have been considered. Recommendations for changes/additions to the directive for safety/health purposes should be submitted to the originator. The originator shall maintain a copy of such occupational safety/health coordination.
- d. **Purchasing Procedures.** Many hazards can be avoided by incorporating appropriate specifications for purchased equipment/ material and contracted efforts that involve work at Commerce facilities. Contracts that require work to be performed by contract personnel at Commerce facilities shall be coordinated with the appropriate safety and health personnel.
- e. **Interim Hazard Abatement Measures.** During the time needed to design and implement permanent hazard control measures, temporary measures are needed. When engineering controls are not immediately applicable, administrative controls and/or personal protective equipment are appropriate for use as interim hazard abatement measures. Interim control measures shall be noted in inspectors' reports, abatement logs, and hazard notices.
- f. **Permanent Hazard Abatement.** Engineering control methods are the best method of hazard control, followed by administrative control and personal protective equipment. Feasible engineering controls shall be used to reduce hazardous exposure, even when only partial reduction of exposure is possible through engineering methods. Two criteria may be applied to determine whether engineering controls are feasible. First, a control is technologically feasible if it is available "off the shelf" or if technology exists which can be adapted to the hazard in question. Second, a control is economically feasible if it can be shown that the cost of the control is justified by the benefit it produces. If the expected reduction of the hazard through the use of an engineering control is insignificant in terms of increased protection, and the cost of implementing the control is great, then the control is economically infeasible.

03. APPLICATION OF HAZARD CONTROL PRINCIPLES

Hazardous workplace conditions may be prevented through appropriate actions when facilities are designed, when operating procedures are developed, and when equipment is purchased. Notwithstanding these preventive measures, hazards will arise as a result of the dynamics of the workplace environment. Once hazards are identified, whether through inspection or complaint, immediate action must be taken to avoid unreasonable danger. The immediate response may differ from the permanent corrective action.

- a. **System Safety Reviews.** System safety engineering and management principles shall be selectively applied to the acquisition of systems and facilities. Safety and health assistance in performing system safety reviews shall be requested as early as possible in the research and development or procurement process. Such early reviews will minimize the possibility of future modifications/alterations as well as the costs and time losses associated with such subsequent changes.
- b. **Design Reviews.** Safety and occupational health aspects shall be considered, designed, and engineered into all facilities which are acquired or constructed for use by DOC employees. Facility design engineers in many instances are not totally familiar with all potential health hazards created by

various materials, equipment and operations used in DOC facilities, nor are they aware of the special design considerations required to control these hazards. To ensure that appropriate hazard control techniques are applied, cognizant industrial hygienists and safety professionals shall participate in the review of plans and specifications for these projects. Recommendations should be submitted in writing. Projects that involve potential health hazards such as toxic materials, radiation, noise, or other health hazards shall be designed in accordance with established principles of good industrial hygiene such as those published by OSHA, NIOSH, ANSI, and ACGIH.

- c. Operating procedures. Standard operating procedures or similar directives that specify the manner in which work is performed shall include appropriate safety and health requirements. Integration of instructions that effect productivity with those that effect well-being of employees is necessary to achieve organization goals in both areas with minimal conflict or confusion.

Originators of such directives that involve work with potential hazards should coordinate with the appropriate safety and health personnel prior to issuance to ensure that applicable DOC requirements have been considered. Recommendations for changes/additions to the directive for safety/ health purposes should be submitted to the originator. The originator shall maintain a copy of such occupational safety coordination.

- d. Purchasing Procedures. Many hazards can be avoided by incorporating appropriate specifications for equipment/material and contracted efforts that involve work at Commerce facilities. Contracts that require work to be performed by contract personnel at Commerce facilities shall be coordinated with the appropriate safety and health personnel.
- e. Interim Hazard abatement measures. During the time needed to design and implement permanent hazard control measures, immediate, temporary measures are needed. When engineering controls are not immediately applicable, administrative controls and/or personal protective equipment are appropriate for use as interim hazard abatement measures. Interim control measures shall be noted in inspectors' reports, abatement logs, and hazard notices.
- f. Permanent Hazard Abatement. Engineering control methods are the best method of hazard control, followed by administrative control and personal protective equipment. Feasible engineering controls shall be used to reduce hazardous exposure, even when only partial reduction of exposure is possible through engineering methods. Two criteria may be applied to determine whether engineering controls are feasible.

First, a control is technologically feasible if it is available "off the shelf" or if technology exists which can be adapted to the hazard in question. Second, a control is economically feasible if it can be shown that the cost of the control is justified by the benefit it produces. If the expected reduction of the hazard through the use of an engineering control is insignificant in terms of increased protection, and the cost of implementing the control is great, then the control is economically infeasible.

04. DEVELOPMENT OF HAZARD CONTROL RECOMMENDATIONS

The following possible actions should be considered when recommendations are developed for the prevention or reduction of hazards:

- a. Avoiding, eliminating, or reducing deficiencies by engineering design, material selection or substitution;

- b. Isolating hazardous substances, components, and operations from other activities, areas, personnel, and incompatible materials;
- c. Incorporating "fail safe" principles where failures would otherwise disable the system or cause a catastrophe through injury to personnel, damage to equipment, or inadvertent operation of critical equipment;
- d. Relocating equipment/components so that personnel access during operation, maintenance, repair, or adjustment shall not result in exposure to hazards such as chemical burns, electrical shock, electromagnetic radiation, cutting edges, sharp points, or toxic atmospheres.
- e. Providing suitable warning and notes of caution concerning required personnel protection in operation, assembly, maintenance, and repair instructions;
- f. Providing distinctive markings on hazardous components, equipment, or facilities;
- g. Requiring the use of personal protective equipment when other controls do not reduce the hazard to an acceptable level;
- h. Monitoring exposure to ensure that engineering controls effectively reduce the hazard; and
- i. Training employees to recognize hazards and take appropriate precautionary measures.

05. RESPONSIBILITIES

The following responsibilities are assigned for directing and supervising an effective occupational safety and health hazard control program.

- a. The Department Safety and Health Program Manager shall:
 - 1. Assist the Department's Designated Agency Safety and Health Official in carrying out the occupational safety and health program responsibilities in matters of hazard control;
 - 2. Review and evaluate the effectiveness of occupational safety and health policies and procedures;
 - 3. Perform research related to identifying and controlling health hazards related to occupational exposures; and
 - 4. Identify, on a continuing basis, equipment, facilities, and materials in the Department which may adversely affect the health and safety of all DOC employees to ensure that health or safety risks are recognized, and evaluate corrective measures taken.
- b. Heads of operating units have the inherent responsibility for the control of occupational safety and health hazards within the operating unit. To assist and ensure such control, site managers and commanding officers shall ensure that all known facets of the hazard control program, including engineering, maintenance, management policy and supervisory controls, are monitored on a continuing basis to ensure the identification and elimination of hazards. Procedures for OSH control shall be applied across the interface (design/engineering /installation/operational/maintenance/disposal) to assure the integration of a dynamic hazard control program consistent with operational and DOC OSH

requirements.

c. ASC Regional Safety Managers and Operating Unit Safety and Health Representatives shall:

1. Assist the Department's Safety and Health Program Manager and operating unit heads in carrying out program responsibilities in the area of hazard control;
2. Identify and evaluate, (in coordination with ASRs) on a continuing basis, safety and health exposure in DOC systems, equipment and materials effecting the safety and health of DOC employees.
3. Ensure that safety and occupational health problems associated with the development, production, use and disposal of new equipment and materials are recognized, and that provisions are made in the development process for their control; and
4. Ensure that systems safety engineering and management principles are complied with during research, development, test, evaluation, production/acquisition of equipment, facilities and material acquired by DOC, as appropriate.

CHAPTER 6

TRAINING

01. POLICY AND DISCUSSION

- a. Studies indicate that an individual's past occupational experience is a factor in reducing the incidence of repeated job-related accidents. However, safety and health training, when effectively provided, can substitute for certain aspects of experience. The goal of the safety and health program is to prevent accidents and illnesses. This goal can only be achieved through a well-developed and coordinated training effort which incorporates training for not only employees, but also safety officials, supervisors and management personnel.
- b. Training programs must be designed in a manner which will instruct individual employees in the performance of their work in a safe and healthful manner. Training should be appropriate to the responsibility level of the individual; however, at a minimum, it must provide personnel with sufficient information for their effective participation in the Department's Occupational Safety and Health (OSH) Program.

02. TRAINING PROGRAMS

Table 6-1 identifies recommended minimum training for all categories of personnel. Records, consisting of training provided, list of attendees, and dates of training, must be maintained for five years. Individual employee personnel records shall reflect the training received.

- a. Top Management Personnel. Top Management personnel shall receive OSH training to enable them to actively and effectively support OSH programs in their specific areas of responsibility. In addition to the coverage of appropriate statutes, regulations, and applicable DOC OSH standards, management level training shall include:
 1. An in-depth examination of management's responsibilities in relation to the DOC OSH program. The general emphasis from this aspect of management level training shall be aimed at insuring that an aggressive and continuing OSH program is implemented throughout the Department. Training topics should include an analysis of compliance procedures, the study of current accident and injury reporting procedures, and a thorough understanding of investigation/inspection procedures;
 2. A review of DOC policy on all relevant aspects of the DOC OSH program. A sound comprehension of the material addressed in this manual is essential to the implementation of an integrated OSH program at all levels throughout the Department; and
 3. A comprehensive examination and analysis of the operating unit program objectives and goals. Typical operating unit program goals include:
 - (a) The reduction of personnel exposure to hazards by abatement procedures or facilities correction;
 - (b) The promotion of an increased degree of OSH awareness throughout the work

environment through an effective training program; and

- (c) The development of plans and procedures for evaluating and improving safety program effectiveness.
- b. Supervisors. Training for supervisors and managers shall include introductory and specialized courses and materials which will enable them to recognize unsafe/unhealthful working conditions and practices in the workplace. Training shall also include the development of skills necessary to manage the Department's OSH program at the work unit level. These management skills require the eventual training and motivation of subordinates in the development of safe and healthful work practices and involve the integration of occupational safety with job training. Newly appointed supervisors are required (under the provisions of DAO 202-411) to receive OSH related training prior to completion of their probationary period.
- c. Non-Supervisory Personnel. OSH training for non-supervisory personnel shall include specialized job safety and health training appropriate to the work performed by the employees. This specialized training shall be directed to the individual's work site and shall include examination of relevant DOC standards, and analysis of material and equipment hazards associated with the work site. Employee training shall be conducted with input and direction from the workplace supervisor and shall include instructions on employee rights and responsibilities under relevant OSH statutes, regulations and the DOC OSH program. Arrangements shall be made to provide training to all new personnel as close to the time of their appointment as possible. Initial training for new employees shall include:
 - 1. Individual responsibility for safety and health;
 - 2. Employee reporting procedures for hazardous operations/conditions;
 - 3. Awareness of hazards common to the individual's work site, trade, occupation or tasks; and
 - 4. Departmental and local policy on occupational safety and health.
- d. Safety and Occupational Health Specialists. These personnel shall be trained through courses, laboratory experiences, field study and other formal experiences to prepare them to perform the necessary technical monitoring, consulting, testing, inspecting, and other tasks that are required of OSH professionals. Training and education shall be provided in accordance with professional development plans and the needs of the ASC/operating unit to support an effective OSH program. Individual development plans for each OSH professional shall be established and will include:
 - 1. On-the-job training on a continuing basis;
 - 2. Special courses of instruction, conferences, seminars, meetings and the like which are related to assigned duties when such training will contribute to their professional development, or performance of assigned duties; and
 - 3. Participation, as appropriate, in the local chapter of the Federal Field Safety and Health Council.
- e. Collateral Duty Personnel. These employees shall receive training necessary for the performance of duties specified by DOC programs within the nature and scope of the unit's operations. Training may be accomplished by attending the OSHA Training Institute course for Federal Agency Collateral Duty Safety Personnel or a course of instruction by a DOC safety professional that encompasses the same

curriculum. At a minimum, training shall include the DOC Occupational Safety and Health Program; section 19 of the Act; Executive Order 12196; 29 CFR 1960; agency procedures for the reporting, evaluation and abatement of hazards; agency procedures for reporting and investigating allegations of reprisal, the recognition of hazardous conditions and practices; identification and use of occupational safety and health standards, and other appropriate rules and regulations. Training should be completed within six months of a collateral duty safety assignment.

03. EDUCATIONAL MATERIAL

OSH educational and promotional materials such as posters, films, technical publications, pamphlets, and related materials can be beneficial in the reduction and prevention of workplace related accidents and illnesses and shall be maintained and subscribed to by DOC activities as an integral part of the DOC OSH program.

- a. Reference Library. Each operating unit and ASC shall maintain a suitable safety and health reference library appropriate to the size and functions of the activity.
- b. Video/Film Library. The ASCs maintain a safety and health video/film library located at MASC. The library consists of 16mm films and VHS format video tapes that can be checked out at no cost. The only requirement is that they be returned insured for \$500. The library is restricted for use by professional DOC safety personnel or qualified ASRS. For specific information, contact the ASR, RSM or OUSHR for your area.
- c. National Safety Council Material. Arrangements should be made to purchase National Safety Council educational and promotional materials through a Federal Supply Schedule contract and local funding.
- d. Other Material. Various periodicals (such as the "Occupational Safety and Health Reporter", published by the Bureau of National Affairs, Inc.), magazines, texts, publications and applicable portions of the Federal Register, will be helpful in updating information for training programs.

TABLE 6-1

TRAINING PROGRAMS

	New Employees Orientation, Including OSH Rights and Responsibilities	Safety Program Annual Report Review	Stand-up Safety Mtgs (various topics)	Hearing Conservation (if applicable)	Hazards of Asbestos (if applicable)	Respiratory Protection (if applicable)	Occupational Health Topics (heat, chemicals etc.) (if approp.)	Professional Development
Top Management	1 hour	1 hr./yr.						
Supervisory Personnel and Employee Reps	1 hour	1 hour per year		1 hour initially 1 hour annual refresher	1 hour per year	1 hour initially 1 hour annual refresher	1/2 hour per month	
Non-Supervisory Personnel	1 hour		5 minutes every 2 weeks	1 hour initially 1 hour annual refresher	1 hour per year	1 hour initially 1 hour annual refresher	1/2 hour per month	
Collateral Duty Safety and Occupational Health Personnel	1 hour	1 hour per year						5 CEU s- or equivalent per year
Full-Time Safety & Occupational Health Professional								8 CEU s - or equivalent per year or, 1 college level course

- Continuing Education Unit (CEU)

CHAPTER 7

SIGHT CONSERVATION

01. POLICY AND DISCUSSION

- a. It shall be DOC policy that all employees working in eye hazardous areas or operations be provided with adequate eye protection at government expense. Employees shall be required to wear appropriate eye protective equipment when performing eye hazardous operations such as pouring or handling of molten metals or corrosive liquids and solids; cutting and welding; drilling, grinding, milling, chipping, and sandblasting or other dust producing operations; and work in areas where there is a likelihood of dust, cement fragments or glass shards.
- b. The design, construction, testing, and use of devices for eye protection shall be in accordance with ANSI Standard Z87.1-1979 and ANSI Z136.1-1980 or the most current edition thereof. Specifications are given for impact protection against flying objects, protection against fine dust particles or liquid splashes, and protection against glare and radiant energy. At a minimum, the protective devices shall be adequate for the hazards specified, reasonably comfortable, and fit snugly without interfering unnecessarily with movement. They must be durable, capable of being disinfected, easy to clean, and maintained in good repair.
- c. In addition, ANSI Z87.1-1979 outlines reasonable ways to select the right equipment and prescribes its safe use. It defines several terms in the eye and face protection field such as absorptive lenses, bridge size, and cover plate. It also establishes requirements for welding helmets, hand shields, and face shields, as well as eye protection designed for various purposes. The standard includes an illustrated selection chart of recommended protectors, along with an applications chart showing what equipment or combinations of equipment best suit each hazardous operation.
- d. All DOC activities which perform eye-hazardous operations shall implement a sight conservation program in accordance with the guidance established in this chapter. The sight conservation program shall include, but not be restricted to, the following program elements:
 - 1. Determination/evaluation of eye-hazardous areas, processes, and occupations;
 - 2. Operation of an employee vision screening program;
 - 3. Procedures for use and application of temporary protective eye wear;
 - 4. An effective maintenance program for eye protective devices;
 - 5. A training/education program; and
 - 6. Effective program enforcement procedures.

02. BASIC PROGRAM REQUIREMENTS

In order to establish an effective sight conservation program, eye-hazardous areas, occupations, and processes must be identified and appropriate controls implemented.

- a. Survey. A complete survey of all DOC work areas and processes shall be conducted to determine which are eye-hazardous, which require eye protection, and the type of eye protection required. In addition to the common eye hazards such as flying objects resulting from certain cutting or drilling operations, the survey shall consider eye hazards associated with exposures to various forms of electromagnetic radiation (e.g., laser, ultraviolet, infrared, and microwave radiation). This survey may be part of the workplace inspection program. A list of all areas, processes, and occupations that require eye protection shall be maintained by ASR. For those sites which fall within the geographical jurisdiction of an ASC, the ASR is urged to coordinate eye protection matters with the RSM.
- b. Posting. All areas designated as eye-hazardous shall be posted with an appropriate warning sign. Such signs shall be consistent with the requirements of 29 CFR 1910.145 and shall be located at all entrances to designated areas as practicable.
- c. Emergency Eyewash Facilities. Emergency eyewash facilities meeting the requirements of ANSI Standard Z358.1-1981 shall be provided in all areas where the eyes of any employee may be exposed to corrosive materials. All such emergency facilities shall be located where they are easily accessible to those in need. Eye wash equipment shall be capable of delivering to the eye not less than 1.5 liters per minute (0.4 gallons per minute) for 15 minutes.
- d. Special Precautions for Visually Impaired Employees. Any employee who is found to have vision in one eye which is 20/200 (corrected) or worse shall be considered visually impaired. The degree of visual impairment shall be considered in duty assignments that present a hazard to the employees' remaining vision. Protective eye wear shall be made available to the vision impaired employee regardless of his/her occupation or work station.

03. VISION SCREENING PROGRAM

All employees required to wear protective eye wear shall be enrolled in a vision screening program. The vision screening program shall consist of a vision screening test conducted annually. An employee's vision will be tested for far vision, near vision, intermediate vision, color perception, depth perception and horizontal peripheral vision. Those employees who wear corrective lenses will be tested both with and without the corrective lenses. Tests will be conducted and results evaluated by a registered nurse, nurse practitioner, or qualified optometric technician. Employees who are deemed to need correction to their current vision will be referred to the proper professionally qualified practitioner for a thorough exam and the appropriate correction.

Site managers are advised to contract for the vision screening program with the nearest U.S. Public Health Service, Federal Employee Occupational Health Office, or the office of a local professionally qualified ophthalmologist or optometrist. At site locations where the Department has a contract the U.S. with the Public Health Service, the vision screening test shall be included the services provided by the contract.

04. PROCUREMENT OF REFRACTIVE EQUIPMENT

- a. Procedures for the procurement of protective eye wear will vary with the individual operating units. The basic requirements an employee must meet are as follows:
 - 1. Work in a designated eye hazardous area and/or operation; and
 - 2. Provide (at the employee's expense) a current prescription for corrective lenses from a

professionally qualified ophthalmologist or optometrist.

- b. Where there is a sufficient number of employees requiring eye protective devices, the operating unit may seek a waiver from GSA to contract with a local, qualified optician to provide protective eye wear/safety glasses. The performance of the contract optician shall be reviewed by the cognizant safety representative. The employee shall not incur the cost of the protective eye wear/safety glasses required by his/her employment.
- c. Corrective-protective eye wear prepared for one person is not medically appropriate to reissue to another. Reclamation of such eye wear is not economically practical; therefore, corrective-protective eye wear is considered to be an expendable item.

05. MAINTENANCE OF PROTECTIVE EYE WEAR

It shall be the responsibility of the individual and his/her supervisor to ensure that personal protective eye wear is maintained in a clean and fully operational condition, and that it is used while performing eye-hazardous operations. The eye wear furnished under the sight conservation program is the property of DOC and shall be repaired or replaced if damaged in the course of employment. Damage to protective eye wear shall be reported to the employee's supervisor as soon after the fact as practicable.

- a. Lens Replacement. Replacement of prescriptive lenses shall be handled in a manner similar to that established for acquiring new corrective-protective eye wear. If the original prescription is more than two years old, a new examination shall be required.
- b. Repairs. Repairs (including frame replacements), adjustments and fittings after repair will be done locally by the refractionist or ophthalmic dispenser and shall be included as part of the contract.
- c. Enforcement. If it is determined that eye wear has been willfully damaged, altered, or lost through negligence, or that employees are not responding to the provisions of the sight conservation program, the supervisor or appropriate management official shall initiate appropriate disciplinary action.

06. TEMPORARY PROTECTIVE EYE WEAR

- a. Planos, goggles, or face shields shall be provided to employees while awaiting delivery of corrective-protective eye wear.
- b. Prevention of eye accidents requires that all persons who may be in eye-hazardous areas or who are in occupations determined to be eye-hazardous occupations wear protective eye wear. All employees, visitors, instructors, or others passing through an eye-hazardous area shall be required to wear eye protection. To provide protection for visitors to an eye-hazardous area, site managers shall procure a sufficient quantity of heavy duty goggles and/or plastic eye protectors, which meet the performance criteria for protective eye wear as contained in ANSI Z87.1-1979. Visitors who normally wear glasses shall be provided with a suitable eye protection devices to wear over the glasses.

Arrangements shall be made by the appropriate office within the operating unit for the issue, care, sterilization, and reissue of these "common use" eye protectors and goggles.

07. EDUCATION

A comprehensive education program on the need for, and use of, protective eye wear shall be conducted at all sites with eye- hazardous areas. This training shall be included in the training program for supervisors and non-supervisory personnel.

Typical topic to be covered in an education program may consist of the following points:

- a. Many jobs call for some form of eye protection against impact, splashes, sparks or glare. It is management's responsibility to provide eye protection equipment and it is the employee's responsibility to use the equipment when required;
- b. Employees who wear contact lenses are required to wear the appropriate eye protection devices at all times when working in areas designated as eye hazardous areas;
- c. Personnel working with or near potentially harmful chemicals or other corrosive materials must know the location of the nearest eyewash fountain and how to use it;
- d. No attempt should be made to remove a particle lodged in the eyeball, or to wash an eye that has been cut in any way. A clean dressing can be placed lightly over the eye until the victim gets medical help. Cold compresses should be applied to a bruised eye. Chemical burns call for immediate flushing with tepid potable water for a minimum of fifteen minutes.

08. RESPONSIBILITIES

- a. The ASR shall have the responsibility for determining eye-hazardous areas, occupations, and processes which require personal protective equipment or other safeguards to protect the eyes and conserve sight.

NOTE: In operating unit field locations, if the ASR requires assistance in determining the need for eye protection equipment, the appropriate RSM should be contacted for guidance.

Specific responsibilities in the determination of eye hazards include:

- 1. A complete survey of all work areas, processes, and operations to determine which are eye-hazardous, which personnel require eye protection, and whether other personnel in the workplace vicinity also require eye protective equipment;
- 2. Recommendations as to the type of eye protective equipment to be used, the personnel effected, and the nature of signs and warning posters needed to alert workers of the presence of an eye hazard area;
- 3. The re-evaluation of previously designated eye-hazardous areas after new processes are adopted, or after modifications to existing processes have been made. Annual workplace inspections and re-evaluations shall be performed to determine the continued need for eye protection;
- 4. The determination of the types of eye protection required in various areas for various processes, and for occupations where engineering controls are technically or economically impractical; and
- 5. Eye injury record retention and review as an additional check on the identification of areas, processes, and occupations where potential eye hazards may exist.

- b. Site managers are responsible for ensuring that adequate funds are available to procure sight screening examination services and safety eye wear for all employees placed in the sight conservation program.

CHAPTER 8

PERSONAL PROTECTIVE EQUIPMENT

01. POLICY AND DISCUSSION

- a. Engineering controls shall be the primary method used to eliminate or minimize hazard exposure in the work place. When such controls are not practical, personal protective equipment shall be used to reduce or eliminate exposure to hazards. However, personal protective equipment is not a substitute for administrative or engineering controls.
- b. It shall be DOC policy that personal protective equipment be provided, used, and maintained when it has been determined by competent authority that its use is required and that such use will lessen the likelihood of occupational injuries and/or illnesses. Operating units shall provide necessary protective equipment where there is a reasonable probability that the use of the equipment will prevent or reduce the severity of injuries or illnesses. Where employees provide their own protective equipment, it shall be the responsibility of the head of the operating unit to ensure its adequacy and to enforce proper equipment maintenance and sanitation procedures.
- c. It must be recognized that personal protective devices do nothing to reduce or eliminate the hazard itself. They merely establish a "last line of defense" and any equipment failure or misuse immediately exposes the employee to the hazard. Many protective devices, through misapplication or improper maintenance, can become ineffective without the knowledge of the wearer and can have potentially serious consequences. For this reason, proper equipment selection, maintenance, employee training (including equipment limitations), and mandatory enforcement of equipment use are key elements in an effective personal protective equipment program.

02. RESPONSIBILITIES

All DOC operating units shall include and enforce the following provisions concerning personal protective equipment:

- a. Evaluate workplaces, including applicable hazardous material data, to determine personal protective equipment requirements. Qualified safety personnel shall perform these evaluations. Outside of the Washington, D.C. area, the operating unit field activity shall coordinate the workplace evaluations with the appropriate RSM;
- b. Ensure that personal protective equipment conforms to DOC OSH standards;
- c. Arrange for appropriate medical evaluations to determine worker capability to perform assigned tasks when there is a reasonable expectation that the use of protective equipment may result in abnormal physiological stress. These evaluations shall normally be restricted to instances where respiratory protective equipment is required.
- d. Train personnel in the selection, use, inspection and care of personal protective equipment required for their situations and maintain records of training completed for a 5-year period;

- e. Ensure that personal protective equipment worn by employees is properly fitted;
- f. Ensure periodic equipment inspection, cleaning, disinfection, and maintenance is performed by qualified personnel;
- g. Provide proper equipment storage to protect against environmental conditions which might degrade the effectiveness of the equipment or result in contamination during storage;
- h. Ensure compliance with the prescribed use of personal protective equipment. All levels of supervision and management should become involved in this effort by personal example. In cases of non-compliance, management may take disciplinary action as a corrective measure against the offender and the supervisor, as appropriate; and
- i. Identify non-use, misuse, or malfunction of personal protective equipment which results in, or may result in, injury or occupational illness to DOC employees. These deficiencies shall be reported as causal factors with sufficient detail to permit evaluation and correction of the problem.

03. EQUIPMENT SPECIFICATIONS AND REQUIREMENTS

All personal protective clothing and equipment will be of safe design and construction for the work to be performed. Standards and specifications for the design and use of personal protective equipment and devices have been developed as a result of extensive research and testing. Only those items that have been recognized and approved shall be used, such as:

- a. Federal Specifications (GSA);
- b. American National Standards Institute (ANSI) Specifications;
- c. National Institute of Occupational Safety and Health (NIOSH); and
- d. Underwriters Laboratories, Inc. (UL).

04. EYE AND FACE PROTECTION

- a. Approved eye and face protection shall be worn when there is a reasonable probability that an injury can be prevented by the wearing of such equipment. Eye and/or face injury can be caused by flying particles and chips, splashes from liquids such as acids, caustics and solvents, operations that generate hot slag or molten metal, welding glare, etc. It shall be the responsibility of the head of the site to provide the required approved protective equipment and enforce its use.
- b. Design, construction, testing and use of devices for eye and face protection shall be in accordance with ANSI Z87.1-1979.
- c. Eye and Face protectors shall meet the following minimum requirements:
 - 1. They shall provide protection against the hazards for which they were designed;
 - 2. They shall be reasonably comfortable when worn under designated conditions;
 - 3. They shall fit snugly and shall not interfere with the movements of the wearer;

4. They shall be durable;
 5. They shall be capable of being disinfected;
 6. They shall be easy to clean;
 7. Protectors shall be kept clean and in good repair.
- d. Employees whose vision requires the use of corrective lenses and are required to wear eye protection, shall wear goggles or spectacles of one of the following types:
1. Spectacles whose protective lenses provide optical correction;
 2. Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles;
 3. Goggles that incorporate corrective lenses mounted behind the protective lenses.
 4. Non-corrective spectacles or goggles will be provided to those employees who wear contact lenses.

Additional information on the DOC OSH Sight Conservation Program is contained in Chapter 7 of this manual.

05. RESPIRATORY PROTECTION

Respiratory hazards may occur through exposure to harmful dusts, fogs, fumes, mists, gases, smoke, sprays, and vapors. The best way to protect personnel is through the use of engineering controls, e.g., local exhaust ventilation. Only when engineering controls are not practical or applicable shall personal respirator protective equipment be employed to reduce personnel exposure. However, in no case shall respiratory protective equipment be used as a substitute for engineering controls. Respiratory protection guidance is provided in Chapter 14. Additional information on the selection of respiratory protection equipment is provided in ANSI Z88.2-1980 and NIOSH certified equipment list DHHS (NIOSH) Publication #88-107.

06. HEAD PROTECTION

- a. Helmets and hats for the protection of employees from the impact of falling and flying objects and from limited electric shock and burn shall meet the specifications of ANSI Z89.1-1981.
- b. All employees required to work in areas where they are exposed to overhead hazards and falling/flying objects are required to wear head protection at all times. Helmets designed to protect against specific hazards will be issued. Head protection shall be maintained in a sanitary and reliable condition.
- c. Supervisors of operating units having employees whose job/area assignments may subject them to falling and/or flying objects are to contact their ASR so that a determination can be made if head protection may be required.
- d. Once a determination is made that head protection is required on the job, its use is considered mandatory, not at the discretion of the employee. Failure of employees to wear head protection shall be cause for disciplinary action for violation of safety regulations, instructions or prescribed safe

practices as outlined in the Table of Offenses and Penalties, DOC Administrative Order 202-751.

- e. Visitors to sites where there is a danger from overhead hazards and falling/flying objects are required to wear head protection at all times. A sufficient quantity of additional head protective devices shall be maintained at the site.

07. FOOT PROTECTION

All employees who work in designated occupational foot hazardous operations/areas shall be furnished appropriate safety shoes/ boots at government expense. The site manager, with advice from the ASR and/or RSM, shall designate local foot hazardous operations/areas and the type of foot protection required. Once it has been determined that safety-toe shoes are required on the job, their use is mandatory. Employees violating this requirement will not be allowed to work; but rather, will be placed on leave (annual leave or leave without pay) by their supervisor until such time that they show up for work wearing the required protective footwear. Failure on the part of the employee to comply with the foot protection program requirements, or failure of unit supervisors to implement the requirements, will be cause for disciplinary action as outlined the Table of Offenses and Penalties in DAO 202-751.

- a. **Foot Hazardous Operations.** Foot hazardous operations are those which have a high incidence of or potential for foot or toe injuries. Examples of trades, occupations and operations generally associated with high incidence of foot injury include construction, materials handling, maintenance, transportation, ship repair and operation, aircraft overhaul and repair, and explosives manufacturing and handling.
- b. **Foot Protective Devices.**
 - 1. Safety shoes, with a built-in protective toe box, are intended primarily to provide protection from heavy falling objects. These shoes shall conform to the requirements of ANSI Z41-1983 and be appropriately labeled.
 - 2. Some special purpose safety footwear, furnished for special hazards, are listed below:
 - (a) Semi-conductive safety shoes are used to dissipate static electricity. To be effective, the shoes must be worn on conductive surfaces, such as wet concrete, metal decks, carbon-impregnated surfaces, wet terrain, conductive linoleum, and conductive tiles.
 - (b) Molder's "Congress" style safety shoes are used for protection of personnel handling molten metal. The design is intended to prevent hazardous materials from falling inside the shoes and to allow quick removal of the shoes in case of emergency.
 - (c) Safety boots are a general purpose footwear item offering the same toe protection as the above safety shoe except in a boot designed for added support. It is not approved for use in hazardous chemical areas.
 - (d) Electrical hazard safety shoes, with a built-in protective toe box, are used to guard against electrical shock hazards when performing electrical work on live circuits not exceeding 600 volts. It should be noted, however, that these shoes only provide partial protection and additional protective measures normally employed in these environments should not be ignored. For example, all personnel working on energized circuits shall be insulated from the ground.

c. Appropriation and Distribution.

1. The primary method for providing safety shoes to employees is to issue commercial safety shoes obtained under the mandatory GSA schedule. Form CD-435 should be completed and processed through the servicing procurement office. A secondary method is reimbursement to employees who buy their own shoes. Form CD-395 should be completed when using this method. Operating units may select the method best suited to local conditions. A dollar value of \$50 is recommended for the purchase of safety shoes.
2. Safety shoes lost, damaged, or stolen due to employee negligence shall be replaced at the employee's expense.
3. Replacement of safety shoes necessitated by normal wear and tear shall be at the discretion of the supervisor after consultation with the ASR or *RSM. Except under extraordinary circumstances, safety shoes should not be replaced more than once every two years.
4. Protective footwear (safety shoes) which fits one person is not medically appropriate for reissuance to another. Reclamation of such footwear is not economically practical, therefore, protective footwear is considered an expendable item.

08. ELECTRICAL PROTECTIVE

Appropriate rubber protective equipment shall be provided for electrical workers who perform hot work. This equipment shall conform to the requirements specified below:

- a. Rubber insulating gloves - ASTM D120
- b. Rubber matting for use around electrical apparatus - ASTM D178
- c. Rubber insulating blankets - ASTM D1048
- d. Rubber insulating line hose - ASTM D*-1050
- e. Rubber insulating hoods - ASTM LD1049
- f. Rubber insulating sleeves - ASTM D1051

09. HEARING PROTECTION

See Chapter 15 for requirements

CHAPTER 9

OCCUPATIONAL SAFETY AND HEALTH INSPECTION PROGRAM

01. POLICY AND DISCUSSION

The OSH inspection program is necessary to ensure a safe and healthful work place for all DOC employees. The inspection program is designed to identify deficiencies which must be corrected to achieve the objectives of the DOC OSH program and to meet the criteria established by OSHA for Federal agencies. The overall DOC OSH inspection program consists of three levels, each fulfilling different objectives:

- a. Workplace Inspections. Workplace safety is the responsibility of each supervisor. To ensure that employees are free from safety or health hazards, each supervisor should inspect his/her workplace at least once each quarter; more frequently if the work performed involves risk (e.g., use of chemicals, radioactive materials, gases, etc.). OSHA requires the annual inspection of the workplace be conducted by qualified individuals. This requirement will be met through an annual inspection of the workplace by the designated Area Safety Representative (ASR). The results of the annual inspection shall be provided to the OUSHR (headquarters organization) or RSM (field organization).
- b. Oversight Inspection. Oversight inspections are the responsibility of the OUSHR and RSM. The purpose of the inspection is to evaluate all aspects of the DOC OSH program. It is conducted when deemed appropriate based on accident/injury statistics, occupational hazards and/or employee complaints.
- c. Occupational Safety and Health (OSH) Program Management Evaluations. OSH Program Management evaluations are the responsibility of the Department's Safety and Health Program Manager. The objectives of these evaluations are to determine the level of compliance with OSHA and DOC program requirements relating to inspections and to provide insight into program areas needing assistance.

02. QUALIFICATIONS FOR INSPECTORS

- a. A successful inspection program requires trained, qualified and competent inspectors must be thoroughly familiar with the equipment in the workplace and of the work practices used. Trained inspectors can identify the "hidden" or subtle safety hazards that routinely go unnoticed. They must be aware of the unique human, physical, and environmental elements that combine to produce hazards or unsafe conditions in the workplace. Inspectors must also be well versed in the details of OSHA and DOC standards and historical occupational safety and health problems associated with the areas they inspect.
- b. Qualifications to be met by inspectors that conduct inspections shall be based upon the degree of hazard and complexity of the areas or operations to be inspected. (Minimum Occupational Safety and Health training requirements are identified in Table 6-1.)

03. WORKPLACE INSPECTIONS

- a. All workplaces shall be inspected at least annually. High hazard areas shall be inspected more frequently. Frequency shall be based upon an assessment of the work performed, the potential for injuries, occupational illnesses, or damage to DOC property. Frequency of inspection in high hazard

areas will be jointly decided by the ASR, the OUSHR (headquarters) and the RSM (in the field).

- b. Competent safety and health personnel shall conduct the required inspections. In the event the ASR lacks the required expertise to conduct an inspection of a high risk work activity, arrangements shall be made with the appropriate OUSHR or RSM to obtain the assistance.
- c. Inspectors shall be provided with appropriate technical test equipment where required.
- d. Inspections shall be conducted in such a manner as to preclude unreasonable disruption of workplace operations. Inspections may be conducted with or without prior notice. No-notice inspections shall be conducted, when in the judgement of the inspector, they will provide a more accurate assessment of actual operating conditions and practices.
- e. Inspectors may deny the right of accompaniment to any person whose participation interferes with a fair and orderly inspection, or who lacks the required security clearance.
- f. Inspectors should discuss with employees of the workplace matters affecting their safety and health. Employees shall be given the opportunity to identify unsafe or unhealthful working conditions to the inspector while remaining anonymous, if the employee so desires.
- g. Imminent danger situations discovered during an inspection shall be brought immediately to the attention of supervisory personnel (in some cases, the site manager or the ship's captain). Affected work shall be stopped and personnel not required for abating the hazard shall be removed from the affected area. Immediate abatement action shall be initiated or the operation shall be terminated.
- h. Written reports of workplace inspections shall be provided to the management official in charge of the operation within a reasonable time, but not later than 20 working days after the inspection.

Inspection reports shall indicate when a follow-up inspection is required. The inspection report shall contain, as a minimum, the date and time of the inspection, a description of the site inspected, a description of each deficiency, the set abatement date, and whether corrective action is (1) required by law, or (2) recommended to ensure a safe and healthful work environment.

Inspection reports shall remain on file with the ASR for a period of five years and shall be made available to those persons approved by the OUSHR. In those areas serviced by an ASC, the ASC RSM shall be provided with a copy of the inspection report.

- i. Follow-up inspections shall be conducted to verify that corrections have been made or to focus on specific problem areas.

Efforts shall be made to use the advice, expertise, and assistance of safety committee, supervisors, employees and others to ensure that Occupational Safety and Health violations are corrected in accordance with accepted practices and that employees are protected from hazards during abatement periods.

- j. Inspections of areas containing classified information or materials shall be conducted following the policies outlined in the DOC Security Handbook.

04. SUPERVISORY WALK-THROUGH INSPECTIONS

The conducting of an annual inspection by the ASR is not adequate for a supervisor and/or the head of an

organizational unit to ensure their employees are provided a workplace free from safety and health hazards. Therefore, it is recommended that the supervisor or the head of the organizational unit inspect the area at least quarterly. High hazard areas should be inspected monthly. Documentation of these inspections is required. The organizational unit site manager or supervisor shall:

- a. Become knowledgeable of the safety and health standards applicable to the activities under his/her control;
- b. Conduct, or cause to be conducted, periodic workplace inspections to locate hazards and identify standards non-compliance; and
- c. Promptly initiate management action necessary to correct hazards.

At site locations where a safety committee has been established, management may elect to delegate the requirement to inspect all workplaces to the committee. The committee members conducting inspections shall have received the level of training recommended in Table 6-1.

05. SHIP WORKPLACE INSPECTIONS

Each shipboard workplace must be inspected to identify all potential safety and health hazards.

- a. A comprehensive inspection shall be conducted at least annually by a qualified ASR in order to assess potential OSH hazards in the fleet. A copy of the inspection will be forwarded to the servicing ASC RSM.
- b. OSH deficiencies identified aboard the ship shall be forwarded in writing to the Commanding Officer for corrective action.
- c. Copies of all inspection reports from industrial hygiene and safety surveys conducted by contract personnel will be forwarded to the RSM for review and retained at the servicing ASC and/or Marine Center.
- d. Oversight inspections will include examination of work practices or procedures in actual progress, examination of the occupational health medical surveillance program within the ship, and an assessment of the effectiveness of the ship's fleet DOC Safety Program.

06. OVERSIGHT INSPECTION

- a. Central to the success of an occupational safety and health program is the provision for oversight inspections covering the total DOC occupational safety and health program. The oversight inspection is designed to evaluate all aspects of the DOC OSH Program, ashore and afloat. Accordingly, the OUSHR (in Headquarters units) and the ASC RSM (in field units) are responsible for the oversight inspections ashore and afloat using the DOC Oversight Inspection format.
- b. The OUSHRs and RSMs shall conduct oversight inspections at the facility level. Selection of these inspection sites will be based on accident/illness statistics, occupational hazards, employee complaints, etc. Sites identified as high hazard sites (e.g., laboratories) will be inspected at least every three years.

07. OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT EVALUATIONS

The Occupational Safety and Health Program Manager shall ensure that OSH Management Evaluations are conducted for the purpose of evaluating ASC and operating unit implementation of OSH programs.

- a. These evaluations shall address the adequacy of the procedures used in conducting workplace inspections and the degree to which other DOC OSH program requirements are met. The evaluation should also provide for an objective assessment of the results of accident prevention efforts, as determined by an analysis of accident or illness data, records, and reports prepared pursuant to Chapter 1 1 of this manual and the workplace inspections described above.
- b. The degree of OSH Management Evaluations should be tailored to the size, mission, and organization of the activity, but shall be of sufficient depth to enable the appropriate officials to monitor the effectiveness of respective activity programs.
- c. Written reports of OSH Management Evaluations shall be forwarded to appropriate officials for action to assure correction of deficiencies. These reports shall contain:
 1. An overall evaluation of the activities in the OSH program;
 2. DOC OSH Program deficiencies observed; and
 3. Recommended corrective actions.

The reports shall be retained on file until the deficiencies have been corrected and for at least five years following the end of the calendar year to which they relate. Procedures shall be established to follow up on the correction of deficiencies identified during OSH Management Evaluations.

CHAPTER 10

EMPLOYEE REPORTS OF UNSAFE/UNHEALTHFUL WORKING CONDITIONS

01. POLICY AND DISCUSSION

- a. This chapter provides guidance in establishment of a channel of communication between DOC employees and those personnel responsible for safety and health. Active support of this channel will assure prompt response to and analysis of reports of alleged unsafe or unhealthful working conditions.
- b. Identification and reporting of potentially unsafe or unhealthful working conditions is the responsibility of all DOC employees. Since many conditions can be eliminated as soon as they are identified, an effective channel of oral and written communication is imperative in the development of a sound OSH program. The employee has the right to decline a task because of a reasonable belief that there is an imminent risk of death and insufficient time for hazard reporting and abatement actions.

02. HAZARD REPORTING

Detection of unsafe or unhealthful working conditions at the earliest possible time and prompt correction of hazards at the lowest possible working level are essential elements of the DOC's Occupational Safety and Health Program. The following procedure is set forth for the submission of employee reports of unsafe or unhealthful conditions in the workplace:

- a. All DOC employees shall be encouraged to orally report unsafe or unhealthful working conditions to their immediate supervisor who will promptly investigate the situation and take appropriate actions. Supervisors will contact the ASR, RSM, or the Operating Unit Safety and Health Representative for assistance. Supervisors will keep the reporting employee informed of all actions taken.
- b. Any DOC employee (or employee representative) may submit a written report of an unsafe or unhealthful working condition directly to the ASR, RSM or OUSHR. Form CD-351 should be used for this purpose (see attachment). If Form CD-351 is not readily available, a legible report containing the following information may be submitted.
 - 1. Reason for report: Safety or health hazard?
 - 2. Your duty station.
 - 3. Specific location of unsafe or unhealthful condition; (e.g., address, building number, room, etc.).
 - 4. Description of the hazard.
 - 5. Action taken by the responsible supervisor to correct hazard (if known).
 - 6. Employees who wish to remain anonymous shall so indicate on the written report.
- c. Upon receipt of a hazard report, the safety representative (ASR, OUSHR or RSM who receives complaint) shall contact the originator by telephone to acknowledge receipt and discuss the seriousness of the reported hazard. The safety representative shall advise the cognizant supervisor that a hazard

has been reported.

- d. The safety representative shall ensure investigation of all reports brought to their attention. Alleged imminent danger situations shall be investigated within 24 hours. Potentially serious situations shall be investigated within three days. If the reported situation involves a health hazard, as opposed to a safety hazard, the safety representative should request the assistance of a competent industrial hygienist for assistance with the investigation.
- e. The safety representative shall provide an interim or complete response in writing to the originator of the complaint (when known) within 15 working days of receipt. Interim responses should include the expected date for a complete response.

If the investigation validates the reported hazard, the complete response shall include a record of the abatement action. If no significant hazard is found, the reply shall include the basis for that conclusion.

- f. The complete response shall encourage, but not require, originator to informally contact the safety representative if he or she desires additional information or is dissatisfied with the response. Complete responses shall indicate the appropriate channels available for formal appeal. Employees may have other rights (see Section 2.07 of this manual).

03. APPEALS

- a. If the originator of a hazard report is dissatisfied with the assessment of the alleged hazard made by the safety representative or with actions taken to abate a confirmed hazard, he/she shall be encouraged to confer with the safety representative to discuss the matter further. If, after this discussion, the originator remains dissatisfied he/she may appeal the determination with the next higher level of safety management.

(See Attachment to this chapter for recommended reporting channels in the Department's Safety and Health Program.) The appeal (or report) shall be in writing and contain at least, the following information:

- 1. A description of the alleged hazard including its location and standards violated, if known (a copy of the original hazard report shall be sufficient);
 - 2. How, when and to whom the original report of alleged hazard was submitted; and
 - 3. What actions (if known) were taken as a result of the original report.
- b. The reviewing safety official shall respond to the originator of the appeal within 10 working days. An interim response shall suffice, if the investigation is incomplete at that time. The final response shall contain the office and address of the next higher level of appeal.
 - c. If the employee is still dissatisfied or has not received a response within 20 working days, he/she may appeal to the next higher level safety official. Subsequent appeals may be submitted if the originator is still not satisfied with the action taken as a result of the previous appeal.
 - d. The final appeal authority for DOC is the Department's DASHO. If the employee is not satisfied with the response from the DASHO, he/she may contact the local office of the Department of Labor, OSHA, and ask to file an employee complaint.

04. REPORTS TO OSHA

Procedures outlined in paragraph 02. Hazard Reporting provide a mechanism for all DOC employees to point out unsafe or unhealthful working conditions to the appropriate authority for in-house resolution. DOC employees may also submit "complaints" alleging workplace hazards directly to the Department of Labor (OSHA); however, the Secretary of Labor encourages employees to use DOC in-house hazard reporting procedures as the fastest means to achieve abatement. Complaints to OSHA may serve as the basis for an investigation or inspection by OSHA officials.

05. RESPONSIBILITIES

Managers and supervisors shall:

- a. Publicize the existence of the employee hazard reporting program and notify all employees regarding their rights and obligations in reporting hazardous situations;

NOTE: The Department of Commerce Occupational Safety and Health Program Poster includes hazard reporting as an employee responsibility.

- b. Maintain the anonymity of personnel making a report if so requested;
- c. Encourage the submission of oral reports to supervisors as the quickest and most effective method of hazard reporting;
- d. Publicize step-by-step procedures and processing channels for employee reporting of conditions believed to be unsafe;
- e. Ensure that employees are not denied access to forms CD-351;
- f. Emphasize the importance of timely and effective response to the report originator and require immediate investigation of reports of imminent danger situations;
- g. Implement safeguards to ensure that no DOC employee is subject to restraint, interference, coercion, discrimination, or reprisal by virtue of their participation in the Department's Occupational Safety and Health Program. Allegations of reprisal for such participation shall be filed in accordance with existing grievance procedures with a copy of the allegations submitted to the Department's Safety and Health Program Manager in a timely manner;
- h. Ensure that adequate recordkeeping practices are maintained and that records are retained for at least five years following the end of the calendar year in which final action on the report was undertaken; and
- i. Ensure that notices advising employees of services, unsafe/unhealthful working conditions, and interim protective measures are posted in the immediate vicinity of a hazard until it is abated.

Attachment

**DEPARTMENT OF COMMERCE
RECOMMENDED
SAFETY AND HEALTH COMPLAINTS
CHAIN OF APPEAL**

1. Local ASR
2. Servicing RSM (if serviced by an ASC) or OUSHR (if not serviced by an ASC)
3. DOC Safety and Health Program Manager
4. DOC Designated Agency Safety and Health Official (DASHO)

CHAPTER 11

INCIDENT INVESTIGATION, REPORTING, AND RECORDKEEPING

01. DISCUSSION

- a. Incidents that result in damage to DOC facilities and equipment and/or injuries and occupational illnesses among DOC personnel seriously degrade the Department's performance and waste tax dollars. Comprehensive investigations of such incidents and accurate record keeping are essential to the success of the DOC Occupational Safety and Health Program.
- b. Investigations to determine how and why an event occurred are necessary to prevent future occurrences of similar events. Accurate records are necessary to establish trends that lead to further investigations and to assess the effectiveness of the overall DOC OSH Program. Further, certain records are necessary to comply with DOL/Federal agency recordkeeping and reporting requirements.
- c. Procedures that apply to all DOC incident investigation, reporting, and recordkeeping requirements relating to the DOC Safety and Health Program are included in this Chapter. The following areas are within the scope of this reference:
 - 1. Accidental injuries, occupational illnesses, fatalities of all DOC employees;
 - 2. Motor vehicle accidents;
 - 3. Accidental damage to government property or equipment other than motor vehicle;
 - 4. Accidents that result in injury to non-DOC personnel; or
 - 5. Accidents which result in property damage to non-government property.

The Department is responsible for providing safe and healthful work places and conditions of employment for all employees. Prompt investigation and reporting of any accident or occupational illness involving Commerce employees or property will provide information necessary for the systematic identification and correction of safety and health hazards.

02. FORMS

The following forms are required to report recordable accident, injury, and illness data:

- a. Form CD-137, Report of Accident/Illness (Revised 5/89). The four part form shall be completed and copies distributed as follows:
 - 1. Pink copy to the employee;
 - 2. Yellow copy to the employee's supervisor;
 - 3. Golden Rod to the Safety Representative;

4. White copy to the Departmental Safety Manager, Office for Procurement and Administrative Services, Safety and Health Office. When the Form CD-137 is completed by an operating unit Safety Representative outside of Washington D.C. and in an area serviced by an ASC, the copy normally sent to the Departmental Safety Manager shall be sent to the ASC Safety Manager.
- b. Form CD-137 shall be used to report accidents/ incidents involving:
 1. Employee injury, illness or death;
 2. Motor vehicles;
 3. Federal property;
 4. Non-Federal person (visitors, sightseers, contractor employees, etc.) and Federal property; and/or
 5. A combination of Federal employees and non-Federal persons and/or government or non-Federal property.
 - c. Form SF-91, Operator's Report of Motor Vehicle Accident and, where appropriate, Form SF-94, Statement of Witness, may be used to record witness identity and accident/illness information, but shall not be used in place of Form CD-137.
 - d. Department of Labor Form CA-1, Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation.
 - e. Department of Labor Form CA-2, Federal Employees Notice of Occupational Disease and Claim for Compensation.

03. REPORTING RESPONSIBILITIES

- a. Employee. Each employee, or someone acting on the employee's behalf, is responsible for the prompt reporting of all accident/illness to his/her supervisor. In addition, the employee is responsible for:
 1. Completion of Items 1 through 16 of Form CA-1 for each traumatic injury sustained while in the performance of his/her job;
 2. Completion of Form CA-2 for each occupational illness or disease sustained in the performance of his/her job;
 3. Timely submission of accident/illness information and workers' compensation forms to his/her supervisor.
- b. Supervisor. Each supervisor is responsible for the timely submission of the following forms:
 1. CD-137, for each person involved in the accident/illness. Once the CD-137 is completed, it shall be distributed in accordance with paragraph 4.a. of this Chapter.

2. Completion of Items 21 through 45, Form CA-1, and obtaining witness information (where appropriate) for the completion of Items 17 through 20.
3. Department of Labor Forms CA-1 and CA-2 shall be forwarded, when completed, to the person designated by the head of the operating unit or ASC Director and assigned the responsibility for coordinating and submitting workers' compensation claims.

The servicing personnel officer should have up-to-date information about the filing of these claims to the centralized Department of Commerce Workers' Compensation Branch.

- c. **Safety Representatives.** The operating unit/ASC Safety Representative (as appropriate) shall enter Form CD-137 information on Form OSHA No. 200, Log of Federal Occupational Injuries and Illnesses (or a computer generated facsimile thereof). A copy of the CD-137 and Form OSHA No. 200 shall be retained by the Safety Representatives for a period of five years following the close of the accident/illness report's calendar year.
 1. Statements from witnesses, photographs, investigative and other supporting data shall be attached to the Form CD-137 and retained by the preparing Safety Representative. In those instances where a claim could be filed against the Department, a copy of the CD-137 and other investigative evidence shall be sent to the Departmental Tort Claims Officer, Departmental Office of the General Counsel, as soon as possible after the accident/illness.
 2. All Safety Representatives shall verify the accuracy of each report and, where authorized, ensure the timely electronic transmission of accident/illness data.
 3. The Department's Safety and Health Office will maintain an automated information system for data on accidents, injuries, and illnesses; analyze these data for causes and costs of accidents; and develop training programs to assist management and safety personnel in accident prevention.

04. INVESTIGATION AND REPORTING PROCEDURES

- a. The Department of Commerce is required to report, immediately, accidents of a significant nature to the Department of Labor. The Department official responsible for the injured employee(s) or damaged property shall report the following incidents, by the quickest method available, to the appropriate Safety Representative who shall inform the Departmental Office of Federal Assistance and Management Support. The Director of Federal Assistance and Management Support has designated the Chief, Health and Safety Division as the Departmental Safety and Health Program Manager. The Departmental Safety and Health Program Manager may designate a person(s) to assist in the investigation of:
 1. Any occupational accident which is fatal to one or more employees;
 2. Any occupational accident which results in the hospitalization of five or more employees or which involves property damage of \$100,000 or more;
 3. Any occupational accident involving Federal or non-Federal employees which results in a fatality or the hospitalization of five or more individuals.

- b. The report of the investigation shall include:
 - 1. Date, time and location of the accident/incident;
 - 2. Names and other identifier information of all persons involved;
 - 3. Number of deaths;
 - 4. Number and extent of injuries/illnesses;
 - 5. Extent of damage to property; and
 - 6. Any other information necessary for the completion of Form CD-137.
- c. Accidents not immediately reportable, but which result in death within six months of the date of the accident, shall be reported to the appropriate Safety Representative within 24 hours from the time the supervisor or other responsible official becomes aware of the death.
- d. All recordable accidents or incidents not subject to the immediate reporting requirements of this section are to be reported on Form CD-137 within five working days.

CHAPTER 12

ORGANIZATION AND STAFFING

01. POLICY AND DISCUSSION

This chapter provides guidance on Occupational Safety and Health (OSH) staffing, organization, and responsibilities. The development and implementation of an effective and viable DOC OSH program at all levels within the Department requires each operating unit to have an organizational element structured to provide direct consultation and liaison with upper management while concurrently serving as the activity focal point on all OSH related matters.

02. ORGANIZATION OF THE DEPARTMENT'S SAFETY OFFICES

- a. Department Level. At the Department level, the authority and responsibility for performing staff functions are vested with the Department's Safety and Health Program Manager.
- b. Administrative Support Center Level (ASC). Each ASC has a Regional Safety Manager (RSM). This safety professional, appointed by the ASC director, provides professional guidance and assistance to all area safety representatives (ASRs), supervisors, managers and employees within the geographical boundaries of the ASC.
- c. Operating Units. The Operating Unit Safety and Health Representative (OUSHR) is appointed by the head of the operating unit and provides assistance and guidance to ASRs, supervisors, managers and employees in areas not serviced by ASC operations. The OUSHR may be either a full time position or a position where the safety responsibilities are collateral to their primary job assignment.
- d. Area Safety Representatives (ASRs). ASRs are assigned or appointed by the site manager and are responsible for implementing the Department's Safety and Health Program at the site. The area of responsibility may be a small part of a building or several adjoining buildings. ASRs, although assigned their safety and health responsibilities by the operating unit site manager, have a reporting responsibility to the RSM servicing their site.

03. STAFFING LEVEL

Several factors will determine the proper level of staffing for occupational safety and health activities. Some of these factors are:

- a. Number of employees serviced;
- b. Types of potential hazards involved in performing job related activities; and
- c. Geographical area of responsibility.

Table 12-1 is a guide to assist managers, supervisors and top management officials in arriving at adequate, minimum level of staffing.

TABLE 12-1**STAFFING GUIDE FOR SAFETY OPERATIONS****Operating Units**

Industrial	1 safety and health professional 1 clerical support
Non-Industrial	1 part-time safety and health professional 1 part-time clerical support

Administrative Support Centers

2 safety and health professionals
1 clerical support

Field Locations**Industrial**

<20 employees	none
20-500 employees	1 collateral duty non-professional 1 part-time clerical support
501-1,500 employees	1 safety and health professional 1 clerical support
>1,500 employees	1 safety and health professional 1 clerical support plus 1 additional safety and health professional for each additional 1,000 employees and major fraction thereof.

Non-Industrial

<20 employees	none
20-500 employees	1 collateral duty non-professional 1 part-time clerical support
>1,500 employees	1 safety and health professional 1 clerical support plus 1 safety and health professional for each additional 1,000 employees and major fraction thereof.

Industrial = High hazard areas such as laboratories, ships, aircraft operations, warehouses and facilities maintenance operations.

Non-Industrial = Low hazard areas as office environments.

CHAPTER 13

ASBESTOS PROGRAM GUIDE

01. POLICY AND DISCUSSION

- a. The purpose of this chapter is to promote a general awareness of potential safety and health problems that could result from the use or disturbance of asbestos or asbestos-containing materials (ACM). An ACM is any material containing greater than 1% asbestos by weight. This chapter also outlines specific precautions and procedures designed to eliminate or control hazards associated with work involving asbestos. However, this document is a general guide only. Specific requirements to limit exposure when working with asbestos-containing materials are outlined in OSHA regulations 29 CFR 1910.1001 and 29 CFR 1926.1101. These regulations must be complied with whenever any asbestos work is performed.
- b. The requirements outlined in this chapter apply to all Department of Commerce (DOC) employees and contractors who work with ACM.
- c. Asbestos is a generic term applied to a number of naturally occurring hydrated mineral silicate fibers, including chrysotile, amosite, crocidolite, tremolite, anthophyllite and actinolite. These materials are heat and/or acid resistant and, until the early 1970's, were used widely throughout the textile, automotive and construction industries as well as places where fireproofing or thermal or acoustical insulation was required. Use of ACM has virtually been eliminated in new construction. Examples of asbestos use include insulation materials sprayed on structural members, fireproofing around ventilation ducts, insulation on exterior surfaces or air-handling ducts, and insulation on piping (primarily valves and fittings on steam and chilled water lines). In addition, such ACM as transite; Canada Board; and heat-resistant gloves, cloth, and rope have been used in the past. Even ambient air may contain a low level of asbestos "dust" from deteriorating vehicle brake linings, roadways, and building materials.
- d. The health hazards associated with exposure (inhalation or ingestion) to airborne asbestos fibers include asbestosis (a lung disorder characterized by reduced lung function and shortness of breath), lung cancer, gastrointestinal cancer, and pleural and peritoneal mesothelioma (cancer of the thoracic and abdominal cavities). The onset of these conditions varies, depending on condition, age, and accessibility of asbestos, concentration of asbestos dust, duration of exposure, fiber size and variety, and individual susceptibility. Research has shown that people who smoke cigarettes and work with asbestos have a much greater chance of developing asbestos-related diseases than non-smokers who work with asbestos.

02. REGULATIONS

- a. The Occupational Safety and Health Administration (OSHA) regulates employee exposure to asbestos fibers. OSHA's regulations are contained in 29 CFR 1910.1001 (which applies to all occupational exposure to asbestos other than during construction work) and 29 CFR 1926.1101 (which applies to all exposures during construction work). The two regulations are very similar but do contain some differences.

1. Any construction activity must comply with the provisions in 29 CFR 1926.1101. For purposes of asbestos work, construction activities include (1) demolition or salvage of structures with asbestos present; (2) removal or encapsulation of ACM; (3) construction, alteration, repair, maintenance, or renovation of structures containing asbestos; (4) installation of products containing asbestos; (5) asbestos spills/emergency clean-up; and (6) transportation, disposal, storage, or containment of ACM on or at a site where construction activities take place.
 2. OSHA has established permissible levels of exposure to asbestos:
 - (a) The **permissible exposure limit (PEL)** is the maximum level of exposure to asbestos an individual may experience over an eight-hour workday, for a 40 hour work week. THE PEL for asbestos is an eight-hour time weighted average (TWA) of 0.1 fibers per cubic centimeter of air (f/cc). No employee may be exposed to an airborne concentration in excess of this amount.
 - (b) The **excursion limit** is the maximum exposure level to asbestos an individual may experience averaged over a 30 minute period. The excursion limit standard for asbestos is 1.0 f/cc. No employee may be exposed to an airborne concentration in excess of this amount during any 30 minute period during an eight-hour workday.
 3. Criteria are also established for monitoring employee exposure levels, regulated areas, personal protective equipment, respiratory protection, housekeeping, medical surveillance, specific hygiene practices and facilities (such as negative pressure endosures, change rooms, showers and decontamination areas), communication of asbestos hazards to employees, and specific record keeping provisions.
- b. The Environmental Protection Agency (EPA) regulates emission of asbestos fibers into the environment under Subpart M, 40 CFR, Part 61. This includes regulating: (1) the handling and disposal of ACM, (2) the manufacture and use of ACM, and (3) the elimination of friable (easily crumbled) asbestos in the public schools.
 - c. Both OSHA and EPA regulations focus on ACM in a friable form. Friable materials have a greater potential for releasing fibers into the air than non-friable materials. As a general rule, non-friable material that has not been disturbed does not need to be removed. However, ACM should be located and periodically inspected for damage to ensure that it remains non-friable.

03. CONTROL METHODS

- a. Engineering controls are the preferred method for controlling/eliminating fiber release from friable ACM. These controls include (1) removal, (2) enclosure, and (3) encapsulation. Of the three, removal is usually the best option. Other engineering controls, such as local exhaust ventilation and dust collection systems, must be used in operations and/or with tools which produce or release asbestos fibers. Engineering controls must be used to reduce exposure to the lowest possible level. Should such controls be insufficient to reduce exposure levels to less than the PEL and excursion limit, they must be supplemented by proper respiratory protection and personal protective equipment (PPE).
- b. Equally as important as engineering controls are proper work practices. Insofar as practicable,

asbestos must be handled, removed, cut, scored, drilled, or otherwise worked with in a wet state sufficient to prevent the emission of airborne fibers. Wetting agents (surfactants) are added to water to create amended water which is used to soak ACM before and during work. Amended water should be applied using an airless sprayer. Application should be made using a fine mist to minimize the release of asbestos fibers from the impact of the spray on the materials.

- c. The OSHA standards also require that all surfaces be maintained free of accumulations of dust containing asbestos. Cleaning of surfaces should be accomplished by using wet methods or with a vacuum cleaner equipped with a HEPA (high efficiency particulate air) filter. A HEPA filter is capable of removing 99.97 percent of the asbestos particles from the air. Under no circumstances should asbestos containing materials be shoveled or swept in a dry state. Compressed air or other air source shall not be used to clean surfaces.
- d. All ACM or materials contaminated with asbestos, including waste debris, scrap, bags, containers, equipment, and clothing, shall be collected and placed in impermeable bags or other impermeable containers and double bagged for disposal. For specific requirements see Section 08 Waste Disposal.

04. PERSONAL PROTECTIVE EQUIPMENT

- a. Only those employees who have received medical approval to wear respiratory equipment may work with ACM. Except for the circumstances outlined below, the OSHA standard does not permit the use of respirators as the primary method of achieving compliance with PEL. Respirators may be used to comply with PEL only under the following circumstances:
 - 1. While engineering controls and work practices are being installed and implemented.
 - 2. For situations where engineering controls and work practices are either technically not feasible to an extent insufficient to reduce the airborne concentrations of asbestos fibers below the PEL and excursion limit.
 - 3. In emergencies.
- b. Where a respirator is required, it shall be provided at no cost to the employee (see Table 13-1). The respirator selected shall be from among those jointly approved as being acceptable for protection by Mine Safety and Health Administration and National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11. Where respiratory protection is required, it shall be selected, used, and stored as specified in 29 CFR 1910.134 (b), (d), (e) and (f).
- c. Special clothing required for asbestos work may include coveralls or similar whole body clothing, gloves, head and foot coverings, and face shields or vented goggles. Use of these articles is required for any employee exposed to airborne concentrations of asbestos fibers above the PEL, the excursion limit or where the possibility of eye irritation exists at no cost to the employee. Where personal protective equipment is required, it shall be selected, used and stored in accordance with 29 CFR 1910.132 (a), (d) and (f). These articles are also required for specific jobs as outlined in the following section.

05. WORK PROCEDURES/REQUIREMENTS

- a. The following specific procedures/requirements apply to any person or group handling, cutting,

removing or otherwise working with ACM.

1. All ACM must be handled or worked with in a wet state unless such wetting will diminish the material's usefulness. Under no circumstances shall the materials be swept while in a dry state. Only specially designed vacuum cleaners equipped with a HEPA filter shall be used to vacuum asbestos-containing debris and scrap material. Refer to Sections 03. b. and c. above for a discussion of the use of wetting agents and specially equipped vacuum cleaners.
2. A regulated area shall be established whenever asbestos work is being conducted in an area where the airborne concentration of asbestos fibers will exceed or can reasonably be expected to exceed the PEL or excursion limit. The regulated area must be marked and entry into the regulated area must be restricted to employees performing the work, their supervisors, and safety and health professionals inspecting the work area/procedures. A negative pressure enclosure must be established whenever removal, demolition, or renovation operations are being performed in a regulated area. The enclosure must have a negative pressure ventilation system and contain a change room, equipment room, and shower. Construction of the negative pressure enclosure and control of the activities within the enclosure must be supervised by a properly trained competent person.
3. Warning signs must be displayed in regulated areas, or whenever airborne concentration of asbestos fibers may be in excess of the PEL or excursion limit. In addition, signs must be posted at such a distance so that employees may read the signs and take necessary protective steps before entering the area marked by the signs. The signs must include:

**DANGER ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY**

Signs are available commercially.

- b. Personal protective equipment, including respiratory protection, must be based on the potential for exposure from the anticipated work activities. It is expected that during these types of projects, engineering controls and work practice controls are either not feasible or insufficient to reduce the exposure to airborne concentrations of asbestos fibers below the PEL or excursion limit. Consequently, respiratory protection and personal protective equipment is necessary.
 1. The following types of work activity require maximum protection:
 - (a) Any removal of large amounts of asbestos-containing pipe, duct, or equipment lagging in a mechanical equipment room, laboratory, or other area in a renovation or replacement project where a complete enclosure of the pipe/duct is impossible.
 - (b) Renovation or modification work involving the removal of asbestos coverings, such as fireproofing material around clusters of exhaust and ventilation ducts.
 - (c) Removal of sprayed-on asbestos fireproofing material on ceilings, beams, and structures, any maintenance or repair activity that results in the disturbance of sprayed-on asbestos fireproofing material.

If a respirator or PPE is required in a regulated area, the warning sign above the area shall read:

**RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA.**

2. The following types of work activity usually require less than maximum protection. Nevertheless, maximum protection should be used until exposure data is available which indicates the actual exposure level is below the PEL and excursion limit.
 - (a) Maintenance or repair of a single valve, flange, pipe fitting, coil, etc., that requires the removal of asbestos-containing pipe or duct lagging material.
 - (b) Work which involves the drilling, cutting (sawing), or grinding of materials containing asbestos (i.e., asbestos millboard, transite, asbestos floor/ceiling tile, etc.) in isolated instances for making certain holes/cuts.
 - (c) Fixed location (shop, lab, etc.) repetitive operations involving the cutting, drilling, grinding of ACM when the tools used are equipped with local exhaust ventilation systems.
 - (d) Vehicle brake maintenance/repair when performed using an approved local exhaust ventilation system for use with brake housing assemblies. Under no circumstance should compressed air be used to clean brake/clutch housing assemblies.
- c. The following work practices are strictly **PROHIBITED** and employees and/or supervisors found using these work practices (or any other work practices not in conformity with the requirements of Chapter 13) will be subject to disciplinary action.
 1. Procurement of ACM or products without the prior written approval of the Department Safety Program Manager, an ASC Regional Safety Manager or an Operating Unit Safety and Health Representative.
 2. Spray application of asbestos products.
 3. Dry removal of ACM.
 4. Removal of any PPE within a regulated area.
 5. Dry sweeping of asbestos containing materials, debris or dust.
 6. Cleaning of asbestos dust and debris with compressed air.
 7. Smoking, eating, or drinking within a regulated area or while wearing protective clothing or equipment.
 8. Unauthorized ACM removal or any operations or maintenance activities involving ACM.
- d. All edges of ACM that have been exposed as a result of a maintenance activity must be encapsulated immediately upon completion of the activity to ensure that asbestos fibers are not released into the work environment.

06. TRAINING

- a. All employees who work with airborne concentrations of ACM at or above the PEL or excursion limit must be trained.
- b. Training must be provided prior to or at the time of the initial assignment to a position which requires working with asbestos and at least annually thereafter.
- c. Employees must receive training in the following:
 - 1. The methods of recognizing asbestos.
 - 2. The health effects associated with asbestos exposure.
 - 3. The relationship between smoking and exposure to asbestos producing lung cancer.
 - 4. The quantity, location, manner of use, release and storage of asbestos, and the specific nature of operations which could result in exposure to asbestos.
 - 5. The engineering controls and work practices associated with the employee's job assignment.
 - 6. The specific procedures implemented to protect employees from exposure to asbestos, such as appropriate work practices, emergency and clean-up procedures, and personal protective equipment to be used.
 - 7. The purpose, proper use, and limitations of respirators and protective clothing, if appropriate.
 - 8. An explanation of the medical surveillance program and its requirements.
 - 9. A review of the OSHA asbestos standards including all the appendices.
 - 10. The names, addresses and phone numbers of public health organizations which provide information, materials, and/or conduct programs concerning smoking cessation.
 - 11. The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.
- d. Employees who perform housekeeping operations in an area which contains ACM or presumed ACM shall be provided at no cost to the employee an asbestos awareness training course. The course shall include:
 - 1. Health effects of asbestos.
 - 2. Locations of ACM or presumed ACM in the building/facility.
 - 3. Recognition of ACM and presumed ACM damage and deterioration.
 - 4. Requirements in the OSHA standard relating to housekeeping and proper response to fiber release episodes.

07. LABELING.

- a. Labels shall be attached to all products containing asbestos greater than 0.1 percent by weight as well as to all containers or bags containing asbestos waste materials. Where feasible, all asbestos products installed and in use shall be labeled.
- b. Labels shall have large letters with a contrasting background and shall read as follows:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD**

- c. All labels shall also contain a statement warning against the hazards of breathing airborne asbestos fibers.

08. WASTE DISPOSAL

- a. All asbestos waste materials, including scrap, debris, bags, containers, equipment, contaminated clothing, and plastic sheeting, must be placed in impermeable bags or containers, labeled, and sealed closed. Waste material placed in plastic bags must be double bagged in bags **at least 6 mil thick**. Large sections of asbestos material, such as sheets of transite, may be double wrapped in plastic, taped and sealed.
- b. All disposal of asbestos waste materials must be conducted in accordance with federal EPA requirements, as well as any applicable state environmental requirements. Each state has specific regulations for the disposal of asbestos waste materials, and the applicable state requirements should be reviewed prior to arranging for disposal. Asbestos waste materials must be transported to an EPA approved and licensed landfill by an EPA approved and licensed transporter. Asbestos waste materials must be disposed of in a special landfill certified by EPA for asbestos; they cannot be disposed of in a municipal landfill. Both the landfill operator and the transporter must have current EPA identification numbers for transporting and disposing of asbestos waste. An asbestos waste shipment record must be completed for the disposal of the waste material, and a copy must be received from the landfill operator. Copies of all asbestos waste shipment records must be retained for a period of two years following the date the waste was accepted by the transporter.

09. MEDICAL SURVEILLANCE

- a. The OSHA standard requires implementation of a medical surveillance program for all employees exposed or who will be exposed to airborne concentrations of asbestos fibers at or above the TWA and/or excursion limit or who are required to wear respirators.
- b. The medical surveillance program includes a physical examination by a physician to include:
 - 1. A medical and work history;
 - 2. A complete physical examination of all systems with emphasis on the respiratory system, the cardiovascular system and digestive tract;
 - 3. Completion of the respiratory disease standardized questionnaire in Appendix D of the OSHA standard;

4. A chest X-ray;
 5. Pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV (1.0));
 6. Any additional tests deemed appropriate by the examining physician;
- c. Medical examinations must be completed in the following time frames:
1. A preplacement exam prior to assignment to an occupation requiring respirator usage, or prior to assignment to an occupation where exposure to airborne concentrations of asbestos fibers at or above the TWA and/or excursion limit is anticipated.
 2. An annual examination.
 3. Termination of employment.
 4. More frequent examinations when specified by the examining physician.

10. RECORD KEEPING

- a. The following records must be maintained:
1. Exposure monitoring records of individual employees must be kept for 30 years.
 2. Medical surveillance records of each employee must be kept for the duration of the employee's employment plus 30 years.
 3. Records of employee training must be kept for one year beyond the employee's employment with DOC.
 4. Copies of asbestos waste shipping papers (properly signed by officials of the facility disposing of the waste, transporter and final disposal site) used to dispose of asbestos waste materials must be retained for two years from the date the waste was accepted for transfer to the waste disposal facility.

11. RESPONSIBILITIES

- a. Managers and supervisors are responsible for assuring that all work involving ACM is performed in accordance with OSHA and EPA standards and requirements. This includes assuring that:
1. All work performed by DOC employees conforms to the requirements of this chapter as well as OSHA and EPA standards.
 2. All work to be performed by contract personnel includes as a part of the contract a requirement for adherence to all OSHA, EPA and local requirements for asbestos control.
 3. The COTR for such asbestos contracts monitors compliance with the requirements.
 4. Provisions are made for routine and/or emergency encounters with asbestos during maintenance operations.

- b. Employees are responsible for notifying their supervisor or area safety representative of conditions or actions that may result in unexpected exposure to asbestos. Employees must also use proper work practices and wear the appropriate PPE as required.
- c. Operating Unit Safety and Health Representative (OUSHR) and ASC Regional Safety Manager (RSM) are responsible for providing guidance to management and employees on the requirements for compliance with the asbestos standards and the proper PPE required.

TABLE 13 - 1

RESPIRATORY PROTECTION FOR ASBESTOS FIBERS

Airborne concentration of asbestos or conditions of use	Required respirator
Not in excess of 1 f/cc (10 X PEL)	Half-mask air purifying respirator other than a disposable respirator, equipped with high efficiency filters.
Not in excess of 5 f/cc (50 X PEL)	Full face piece air-purifying respirator equipped with high efficiency filters.
Not in excess of 10 f/cc (100 X PEL)	Any powered air-purifying respirator equipped with high efficiency filters or any supplied air respirator operated in continuous flow mode.
Not in excess of 100 f/cc (1,000 X PEL)	Full face piece supplied air respirator operated in pressure demand mode.
Greater than 100 f/cc (1,000 X PEL) or unknown concentration	Full face piece supplied air respirator operated in pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus.

CHAPTER 14

RESPIRATORY PROTECTION

01. POLICY AND DISCUSSION

- a. This chapter outlines requirements and responsibilities for the DOC respiratory protection program. Specific respiratory requirements for protection against toxic air contaminants are covered in OSHA regulation 29 CFR 1910.134.
- b. The requirements outlined in this chapter apply to all Department of Commerce (DOC) sites where operations may cause the release of harmful air contaminants. These air contaminants can be dangerous if inhaled and cause occupational diseases. Respiratory protection is mandatory whenever personnel may be exposed to harmful air contaminants and/or when oxygen deficient atmospheres exist or are likely to exist.
- c. Respiratory hazards can occur in the form of harmful dusts, fogs, fumes, mists, gases, smoke, sprays, or vapors. The best means of protecting personnel from being exposed to such potentially hazardous materials is through the use of accepted engineering control measures such as local exhaust ventilation. However, the use of engineering control measures may not always be technologically or economically feasible due to the nature and/or location of the activities. In these situations the use of appropriate respiratory protection must be used to assure personnel protection.

02. APPLICABILITY

- a. The requirements of this chapter shall apply to:
 - 1. Employees identified by the Area Safety Representative (ASR), Operating Unit Safety and Health Representative (OUSHR), Regional Safety Manager (RSM) and/or the DOC Safety Program Manager as requiring respiratory protection equipment due to the nature of their work or job.
 - 2. Any individual who must enter an area where the use of respiratory protection equipment is required, regardless of the amount of time they will be in the area.
 - 3. Any individual provided with respiratory protection for humanitarian and/or employee morale reasons even when such protection is not required.
- b. Appropriate respiratory protection equipment will be provided to employees at job site:
 - 1. Such equipment shall be provided along with instructions regarding equipment use and limitations.
 - 2. All individuals provided with respiratory protection will be enrolled in the Respiratory Protection Program.
 - 3. Any individual provided with respiratory protection for humanitarian and/or employee morale reasons even when such protection is not required.

- c. Appropriate respiratory protection equipment will be provided by the Department to these individuals.
 - 1. Such equipment shall be provided along with instructions regarding equipment use and limitations.
 - 2. All individuals provided with respiratory protection will be enrolled in the Respiratory Protection Program.

03. RESPONSIBILITY

- a. Site managers are responsible for:
 - 1. Establishing a comprehensive respiratory protection program, when required;
 - 2. Ensuring all appropriate individuals are enrolled and participate in the program;
 - 3. Appointing a qualified person to oversee the program (generally, an industrial hygienist, ASR, or OUSHR with respiratory protection training is considered qualified); and
 - 4. Ensuring that adequate funds are available to procure examination services and respiratory protection equipment for all employees placed in the respiratory protection program.
- b. Supervisors are responsible for:
 - 1. Anticipating and planning for routine and emergency use of respirators;
 - 2. Informing the ASR of job conditions that are suspected of exposing employees to respiratory hazards;
 - 3. Assuring that all employees whose jobs require the wearing of respiratory protection equipment receive instruction in the selection, use, and maintenance of such equipment;
 - 4. Ensuring employees are provided with and properly use required respiratory protection equipment; and
 - 5. Taking appropriate action to implement and enforce the respiratory protection program requirements discussed in this chapter.
- c. Employees are responsible for:
 - 1. Notifying their supervisor or ASR of conditions that could result in exposure to respiratory hazards;
 - 2. Obtaining and wearing appropriate respiratory protection equipment whenever required and in accordance with instructions and training received;
 - 3. Participating in training and fit-testing sessions provided by the ASR; and
 - 4. Reporting any malfunction of respiratory protection equipment to their supervisor and ensuring that equipment is maintained in good working order.

- d. ASRs or other qualified persons appointed to oversee the program are responsible for:
 - 1. Determining if respiratory protection is required based upon the nature and/or extent of the hazard;
 - 2. Advising supervisors and users on proper selection of respiratory protection equipment;
- NOTE: In field locations, if the ASR requires assistance in determining the need for and the selection of respirator protection equipment, the appropriate RSM or OUSHR should be contacted for guidance.
- 3. Providing training to supervisors and employees in the respiratory protection program, as required; and
 - 4. Conducting random inspections to ensure that respirators are being properly selected, used, maintained and stored.
- e. OUSHRs and RSMs are responsible for providing guidance to ASRs, managers, and employees on compliance with respiratory standards and mandatory use of personal protective equipment.

04. PROGRAM REQUIREMENTS

- a. Standard Operation Procedures (SOPs) governing the selection, care, issuance and use of respirators must be in writing at each operation which requires a respiratory protection program. Procedures must include guidance on emergency and rescue operations.
- b. Respirators must be selected on the basis of hazards to which the worker is exposed.
- c. All users must be instructed and trained in the proper use and limitations of respirators.
- d. Respirators must be regularly cleaned and disinfected. Those used by more than one worker must be cleaned and disinfected after each use.
- e. Respirators must be stored in convenient, clean, and sanitary locations.
- f. Respirators used routinely must be inspected during cleaning. Worn or deteriorated parts must be replaced.
- g. Respirators for emergency use, such as self-contained devices, must be thoroughly inspected at least once a month and after each use.
- h. Appropriate surveillance of work area conditions and degree of employee exposure or stress must be maintained.
- i. Regular inspections and evaluations must be performed to determine the continued effectiveness of the program.
- j. Persons must not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The respirator user's medical status must be reviewed at least annually.

- k. Approved or accepted respirators must be used when they are available.

05. TYPES OF RESPIRATORS

There are two basic categories or types of respiratory protective equipment: Air purifying respirators and atmosphere-supplying respirators.

- a. Air-purifying respirators use mechanical filters or sorbents (chemical cartridges) to remove harmful substances from the air. Air-purifying respirators may not be used in oxygen deficient atmosphere (less than 19.5 percent by volume) or under immediately-dangerous-to-life-or-health (IDLH) conditions. Air-purifying respirators can be classified as follows:

- 1. Particulate removing respirators, which filter out dusts, fibers, fumes and mists. These respirators may be single-use (disposable) filter respirators or respirators with replaceable filter cartridges.

NOTE: Surgical masks do not provide protection against air contaminants. They are never to be used in place of an air-purifying respirator. They are for medical use only.

- 2. Gas and vapor-removing respirators, which remove specific individual contaminants or a combination of contaminants by adsorption or by chemical reaction. Gas masks and chemical-cartridge respirators are examples of gas and vapor-removing respirators.
- 3. Combination particulate/gas and vapor-removing respirators, which combine the respirator characteristics of both kinds of air-purifying respirators.

- b. Atmosphere-supplying or supplied-air respirators provide clean breathing air from a source outside the contaminated area. The breathing air may be supplied through a hose (air-line) from a cylinder, an air compressor, or another source of clean air.

Only certain types of atmosphere-supplying respirators may be used in oxygen-deficient or IDLH conditions. The breathing air supplied to these respirators must meet the requirements of Class D breathing air as outlined in 29CFR 1910.134(d). Supplied-air respirators, also called air-line respirators, are classified as follows:

- 1. Demand. This type of respirator supplies air to the user on demand (inhalation), which creates a negative pressure within the facepiece. Leakage into the facepiece may occur if there is a poor seal between the respirator and the user's face.
- 2. Pressure-demand. This type of respirator maintains a continuous positive pressure within the facepiece, thus preventing leakage into the facepiece.
- 3. Continuous flow. This type of respirator maintains a continuous flow of air through the facepiece and prevents leakage into the facepiece.

06. SELECTION AND USE

- a. All respirators selected for use must be "approved" for protection from the toxic material to which the employee is exposed. Only respirators with a NIOSH/MSHA approval shall be used. Respirators are approved as a whole unit; components may not be interchanged between respirators

- b. The selection of an appropriate respirator for the task to be performed shall be made according to guidance from the American National Standard Practices for Respiratory Protection Z88.2-1969 (ANSI Z88.2-1969). As a minimum, the following factors must be considered when selecting the appropriate respirator:
1. Whether an oxygen deficient, oxygen rich, or IDLH atmosphere exists or may be produced.
 2. The nature of the hazard, i.e., the physical and chemical properties, the physiological effects on the body, the concentration of the toxic material including the peak and average concentration expected, and the degree of protection necessary.
 3. Permissible Exposure Limit (PEL) for the contaminant(s).
 4. Whether toxic, flammable, or explosive by-products are present or may be produced.
 5. The nature, extent, frequency and duration of the duties to be performed by personnel (e.g., welding, painting, etc.) in the work area.
 6. Sorbent efficiency of cartridge or canister.
 7. Any possibilities of high heat of reaction with sorbent material in the cartridge or canister.
 8. Any possibility of shock sensitivity (explosion hazard) of the substance absorbed on cartridge or canister sorbent.
 9. The degree of protection required and the protection factor of the respirator.
- c. Table 14-1 is a flow chart which will aid in determining the proper selection of respiratory protection equipment. It is recommended that the simplest and most comfortable and convenient respirator which will adequately protect against the hazard in question be selected. Table 14-2 provides a listing of some common exposures requiring the use of respirators and the type of respirator required.
- d. A respirator user must be aware of warning signs and what action to take if there are signs of respirator failure. They are as follows:
1. Particulate Air-Purifying Respirators. Difficulty in breathing due to resistance. Usually caused by partial clogging of filter. Filter must be replaced. Disposable filter respirators must be discarded.
 2. Gas or Vapor Air-Purifying Respirators. Detection of warning properties such as odor or taste, eye irritation, or respiratory irritation. Promptly leave the area. Check equipment assembly. If no discrepancies are observed, replace the cartridge or canister. If any of the warning properties appear again, the concentration of the contaminants may exceed the cartridge or canister design specifications. When this occurs, a supplied-air respirator is required.
 3. Supplied Air Respirator. Compressor failure alarm is activated or air pressure drop is sensed. Leave the area immediately. Check equipment. Replace air supply.
- e. Service Life of Air-Purifying Respirator Canisters and Cartridges. The canisters or cartridges of air-purifying respirators are intended to be used until filter resistance precludes further use, or the chemical

sorbent is expended as signified by a specific warning property. New canisters, cartridges or filters must always be provided when a respirator is reissued. When in doubt about the previous use of the respirator, obtain a replacement canister or cartridge.

07. MEDICAL EXAMINATION

Employees assigned to tasks requiring the use of a respirator must be physically able to perform the work while wearing the respirator. Employees must be examined by a physician at least annually. The examining physician shall determine which health and physical factors are pertinent for the employee's ability to work while wearing a respirator.

Factors to be considered include a history of emphysema, chronic obstruction, bronchial asthma, hypertension, epilepsy, anemia, diabetes, claustrophobia, pneumoconiosis, or pneumomediastinum. A chest X-ray and pulmonary function test shall be part of the examination.

08. FIT TESTING

- a. All employees using respirators must be fit tested so that respirators fit properly and provide the degree of protection necessary under actual wearing conditions.
- b. A quantitative or qualitative fit test shall be performed initially, and at least annually thereafter, whenever an employee is required to wear a respirator. The type of fit test will be determined based on the degree of the hazard involved and pertinent regulations.
 1. A quantitative fit test involves exposing the employee to a test atmosphere containing an easily detectable, non-toxic, test agent and quantitatively measuring the penetration of the test agent into the respirator. During the test, the employee will be asked to perform a number of exercises which simulate the work environment and could induce leakage of the facepiece. A quantitative fit test provides the most accurate information about the respirator fit.
 2. A qualitative fit test involves the introduction of an odorous or irritating substance into the breathing zone of the respirator wearer. A subjective determination that the substance can be detected indicates an improper fit for the respirator.
- c. The results of the quantitative and qualitative fit test are used to select specific types, makes, and models of respirator facepieces which provide the best fit and which will provide the best protection against harmful substances for the individual employee. An employee must only use the specific make(s) and model(s) of respirators with which a satisfactory fit was obtained.
- d. Respirator fit testing must be documented and must include the type of respirator, brand name and model, method of test and test results, test date, and the name of the instructor/tester.
- e. Respirators shall not be worn when conditions prevent a good face seal or interfere with respirator function. Conditions which prevent a good face seal include (but not limited to) beard growth, sideburns, the absence of teeth or dentures, unusual facial configuration, temple bars on glasses, or the wearing of any object that projects under the facepiece.

09. TRAINING

- a. Employees must receive training in the proper use of the respiratory equipment and the limitations of the equipment.

The training must include instructions on fitting the respirator and how to check the facepiece-to-face seal using the qualitative field test. Prior to first using a respirator in a work situation, the employee

must be given the opportunity to handle the respirator, wear it in normal air for a period of time, practice adjusting it, and become familiar with it.

- b. Training for employees should include an explanation of the following:
 - 1. The nature of the hazard and what may happen if the respirator is not used properly and exposure occurs.
 - 2. Engineering controls in use, if any, and the need for the added protection of the respirator.
 - 3. Reasons for the selection of a particular type of respirator and the limitations of the respirator selected.
 - 4. The proper method of donning and wearing the respirator, checking the fit and the operation of the respirator.
 - 5. Proper inspection, maintenance and storage of the respirator.
 - 6. How to handle emergency situations that may arise while wearing the respirator.

10. CLEANING AND STORAGE

- a. Respirators shall be cleaned and disinfected after each day's use or more frequently if necessary. Cleaning may be accomplished by hand cleaning or machine cleaning. When machine cleaning is used, care must be taken to insure against excessive tumbling or extreme temperature (usually above 120° F). Disinfection is required when the respirator is used by more than one person and is not individually assigned.
- b. The most commonly used cleaning solution is warm soapy water, but commercial cleaning solutions may also be used. Disinfection solutions commonly used include a 50 PPM solution of chlorine (about 2 ml bleach to 1 liter of water) and an aqueous iodine solution (about 0.8 ml tincture of iodine in 1 liter of water). Commercial disinfection or decontamination solutions are also available. The manufacturer's instructions should be followed for all commercial solutions used.
- c. Respirators should be stored in a convenient, clean, and sanitary location, where they are protected from dust, harmful chemicals, sunlight, excessive heat or cold, and moisture. Suggested storage containers to protect the respirator from harmful agents include plastic bags capable of being sealed (such as Zip-Lock bags), plastic containers with tight fitting lids, or cans with tight fitting lids.

The respirators should be allowed to rest in a normal position in the container. Respirators must not be hung by the respirator straps.

- d. Respirators used strictly for emergency purposes should be stored in an easily accessible and well-marked location.

11. INSPECTION AND MAINTENANCE

Respirators must be inspected regularly for damage, preferably prior to each use. The condition of the

facepiece, straps, inhalation and exhalation valves, cartridges, canisters, air hoses, and air cylinder should be checked. Any damaged parts must be replaced. Respirators must be maintained in operating condition, especially emergency use respirators.

12. RECORDKEEPING

The following records must be maintained:

- a. Records of employee training.
- b. Records of employee fit test results.
- c. Records of inspection dates and findings must be kept for all respirators maintained for emergency use.

TABLE 14-1
RESPIRATORY PROTECTION

Airborne concentration of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals	Requested respirator
Not in excess of 2 f/cc Half-mask air-purifying (10 x PEL). respirator with high- efficiency filters.	
Not in excess of 10 f/cc (50 x PEL). purifying respirator equipped with high- efficiency filters.	Full facepiece air-
Not in excess of 20 f/cc (100 x PEL). respirator equipped with high-efficiency filters.	Any powered air-purifying
OR	
Any supplied-air respirator operated in continuous flow mode.	
Not in excess of 200 f/cc (1,000 x PEL). air respirator operated in pressure demand mode.	Full facepiece supplied-
Greater than 200 f/cc Full facepiece supplied- (>1,000 x PEL) or air respirator operated in unknown concentration. equipped with an auxiliary positive pressure self- contained breathing apparatus.	pressure demand mode

NOTE:

1. Respirators assigned for higher environmental concentrations may be used at lower concentrations.
2. A high-efficiency filter means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers or larger.

TABLE 14-2

RESPIRATORY PROTECTION FOR VARIOUS OCCUPATIONAL EXPOSURES

EXPOSURE	RESPIRATOR TYPE
Nuisance Dusts	Disposable Filter
Nuisance Odors	Chemical Cartridge*
Asbestos	High Efficiency Filter Cartridge or Supplied-Air

RESPIRATOR

Acid Gases and Organic Vapors	Chemical Cartridge*
Dusts, Mists, Fumes (with TWA less than 0.05 mg/m ³)	Filter
Dusts, Mists, Fumes (with TWA of 0.05 mg/m ³ or greater)	High Efficiency Filter Cartridge*
Mercury Vapor	Supplied-Air Respirator
Paint Spray and Vapors	Chemical Cartridge and
	Refilter
Pesticides	Chemical Cartridge*
Radionuclides, Bacteria and Viruses	High Efficiency Filter Cartridge*
Welding and Metal Fumes	High Efficiency
	Filter Cartridge*
Hazardous Operations (welding, etc.) In confined spaces	Supplied Air
Fire Suppression, Oxygen Deficient Atmospheres, High Unknown Concentrations of Contaminants	Self-Contained Breathing Apparatus**

*These items must be used with a half-mask respirator facepiece.

**The use of self-contained breathing apparatus requires extensive training and experience. Its use is reserved for fire suppression, emergency rescue, etc., in oxygen-deficient/highly contaminated atmospheres.

CHAPTER 15

HEARING CONSERVATION AND NOISE ABATEMENT

01. POLICY AND DISCUSSION

- a. Historically, hearing loss has been recognized as an occupational hazard of certain trades such as blacksmithing and boilermaking. Modern technology has extended this risk to many other career fields including forging, aircraft and ship operations, construction, and industrial research. Exposure to high-intensity noise occurs as a result of either impulse or blast noise such as gunfire or from continuous or intermittent sounds such as jet or propeller aircraft. Hearing loss has been and continues to be a source of concern with the Department. It not only contributes to the high cost of compensation claims, but also results in a decline in productivity and efficiency.
- b. It is DOC policy that all employees working in a noise hazardous area be protected from noise levels that exceed OSHA standards. Engineering and administrative controls shall be the primary methods used to eliminate or reduce these noise exposures. When such controls are not feasible or insufficient to reduce noise levels to an acceptable level, the use of hearing protective devices is mandatory. However, in no case shall hearing protective devices be a substitute for proper engineering or administrative controls. Acceptable noise exposure levels are prescribed in Table 15-1.
- c. Hearing protective devices establish a "last line of defense," and do nothing to reduce or eliminate the source of high level noise. These protective devices may become ineffective through misuse, misapplication or improper maintenance, and expose the employee unknowingly to dangerous noise levels. Consequently, employees must receive proper training in the selection, use, and limitations of hearing protective devices. Where hearing protective devices are provided to employees, their use is mandatory. Failure to use the equipment may result in disciplinary action.
- d. Managers must ensure that all employees whose work environment has a noise level equal to or greater than 85 dBA as an 8-hour time weighted average (TWA) are enrolled in a Hearing Conservation Program. For purposes of the Hearing Conservation Program, noise levels shall be measured and noise exposure computed according to Table 15-2.
- e. The Department shall establish and maintain an Audiometric Testing Program as delineated in this chapter. This program shall be made available to all employees whose noise exposure is equal to or exceeds an 8-hour time-weighted average of 85 decibels.

02. HEARING CONSERVATION PROGRAM REQUIREMENTS

The goal of the DOC Hearing Conservation Program is to prevent occupational noise-related hearing loss to DOC personnel. The program shall include the following elements:

- a. Monitoring of employee noise exposure levels to identify employees who must be enrolled in the Hearing Conservation Program and to identify those employees for whom hearing protection is mandatory.
- b. Notification of the results of the monitoring to each employee whose exposure is at or above an 8-hour time weighted average (TWA) of 85 dBA.

- c. Provisions for observation of the monitoring by employees or employee representatives.
- d. An Audiometric Testing Program for all employees whose exposure is equal to or greater than 85 dBA as an 8-hour time weighted average, which includes provisions for establishing a baseline audiogram, annual audiograms, evaluation of audiograms by an audiologist, otolaryngologist or physician, and follow-up audiograms and procedures.
- e. Audiometric measuring instruments and audiometric test rooms which meet with specifications in 29 CFR 1910.95.
- f. Availability of hearing protective devices at no cost to the employee, and employee opportunity to select among a variety of hearing protectors.
- g. A training program for all employees enrolled in the Hearing Conservation Program and which informs employees about the effects of noise on hearing; the purpose, advantages and disadvantages of hearing protective devices; selection, fitting, use, and care of hearing protective devices; and the purpose of audiometric testing, including an explanation of the test procedures.
- h. Maintenance of employee exposure records for a period of 20 years and audiometric test records for the duration of the employee's employment.

03. PERMISSIBLE EXPOSURE LIMIT (PEL)

The PEL is the maximum level of exposure an individual may experience over an 8-hour workday. The PEL for occupational exposure to noise is listed below:

- a. Equal to or less than 90 dBA for 8 hours in any 24 hour period. Exposure at higher noise levels is permitted for short periods of time, refer to Table 15-2, as long as the TWA is equal to or less than 90 dBA.
- b. Equal to or less than 140 dB peak sound pressure level at any time for impact or impulse noise.
- c. Equal to or less than 82 dBA for a 24-hour effective exposure level [Leff (24)]. This level applies to shipboard personnel while aboard vessels.

04. NOISE MEASUREMENTS AND EXPOSURE ASSESSMENTS

- a. Noise Measurements. To effectively control noise, it is necessary that the noise be measured according to standard procedures and that the measurements be properly evaluated against accepted criteria. To achieve this, the following must be accomplished:
 - 1. A complete survey of all work areas, processes, and operations to identify potential noise hazardous areas must be performed by a properly trained person. Monitoring of noise levels is required when information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average (TWA) of 85 dBA or a dose of 50 percent.
 - 2. The sampling strategy used for monitoring must be designed to identify employees for inclusion in the Hearing Conservation Program and to help in the selection of proper hearing protective devices.

3. Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise makes area monitoring inappropriate, personal sampling must be conducted.
 4. All continuous, intermittent, and impulsive sound levels from 80 decibels to 130 decibels must be integrated into the noise measurement.
 5. Instruments used to measure noise must be calibrated to ensure accuracy of the measurements.
 6. Monitoring must be repeated whenever any significant modification or change in the work routine occurs which could alter the noise exposure level.
 7. All noise measurements taken to determine an individual's exposure level must be conducted with the microphone of the measuring instrument placed at a height which most closely approximates the position/location of the worker's ear during normal working conditions. Repeated measurements may be required during a single day and/or on different days of the week to account for the variations in noise levels produced by changes in operational schedules and procedures.
 8. Records of noise measurements must be kept for a period of 20 years and include as a minimum.
 - (a) Location and type of noise sources.
 - (b) Number and identification of personnel in the work area and their daily noise exposure and duration.
 - (c) Calibration data for the instrument used.
 - (d) Location, date and time of noise measurements.
 - (e) Noise levels measured and hazard radius.
 - (f) Name and signature of person(s) who performed the study.
- b. Exposure Assessments. The analysis of noise measurements in order to assess the hazard potential is a complex task that must be performed by an industrial hygienist or other competent person under the direction of the RSM or OUSHR. A complete analysis may require use of octave band analyzers, recorders, and other specialized acoustical instrumentation such as personal noise dosimeters.
1. The requirements outlined in this chapter, 29 CFR 1910.95, and/or DOT U.S. Coast Guard Navigation and Vessel Inspection Circular No. 12-82 shall be used to determine compliance.
 2. An area shall be designated as a "hazardous noise area" when:
 - (a) The A-weighted sound level (continuous or intermittent) in the work area is routinely equal to or greater than 85 dB; or
 - (b) The peak sound pressure level (impulse or impact noise) in the work area routinely

exceeds 140 dB.

The designation of a “hazardous noise area” shall be made by a properly trained ASR, RSM or OUSHR.

3. In the absence of an exposure assessment to the contrary, personnel exposed to sound levels equal to or greater than 85 dBA or 140 dB peak sound pressure level for impact or impulse noise must be considered at risk and be identified on a roster for inclusion in the Hearing Conservation Program. Although hearing conservation measures are required when noise levels are equal to or greater than 85 dBA, the implementation of all available measures may not be necessary in every case. For example, visitors to a hazardous noise area should be required to wear hearing protection, but would not be required to have their hearing tested or be included on a roster of noise exposed personnel. There may also be unique situations where sound levels rise unpredictably above 85 dBA for short durations so that the wearing of hearing protective devices may be judged impractical or unnecessary.

Decisions to waive the use of hearing protective devices must not be made arbitrarily; such professional judgments should be rendered by an industrial hygienist or other qualified professional using approved instrumentation and in consideration of all relevant factors.

05. LABELING OF HAZARDOUS NOISE AREAS AND EQUIPMENT

Designated hazardous noise areas and equipment which produce sound levels equal to or greater than 85 dBA, or 140 dB peak sound pressure level shall be appropriately labeled. Posting of an entire building as a hazardous noise environment is not recommended unless nearly all areas within the building are designated hazardous noise areas.

06. HEARING TESTING AND MEDICAL EVALUATION

All DOC employees who are required to work in designated hazardous noise areas or with equipment which produces a TWA equal to or greater than 85 dBA or a peak sound pressure level of 140 dB, shall be entered in a audiometric testing program. The testing program consists of baseline and periodic audiometric (hearing) tests with specific test requirements.

- a. Audiometric Testing Program. In order to obtain valid audiometric tests the following requirements must be met:
 1. Audiometric tests must be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation.
 2. Audiometric tests must be pure tone, air conduction hearing threshold examinations, with test frequencies including a minimum of 500, 1000, 2000, 3000, 4000, and 6000 Hz and shall be taken separately for each ear.
 3. Audiometric tests must be conducted with audiometers that meet the specifications of and are maintained and used in accordance with the most current edition of American National Standard Specification for Audiometers, S3.6-1969 and as required by Appendix C of 29 CFR 1910.95.
 4. Pulsed-tone and self-recording audiometers must meet the requirements specified in Appendix C of 29 CFR 1910.95.

5. Audiometric examinations must be administered in a room meeting the requirements listed in Appendix D of 29 CFR 1910.95.
6. The functional operation of the audiometer must be checked before each day's use by testing a person with known stable hearing thresholds and by listening to the audiometer's output to make sure that the output is free from distorted or unwanted sounds.

Deviations of 10 decibels or greater require an acoustic calibration.

- a. Audiometer calibration must be checked acoustically at least annually in accordance with Appendix E of 29 CFR 1910.95. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check. Deviations of 15 decibels or greater require an exhaustive calibration.
- b. An exhaustive calibration must be performed at least every two years in accordance with the American National Standard Specification for Audiometers, S3.6-1969. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this calibration.
- c. Reference (Baseline) Hearing Tests. Any employee whose job assignment involves routine exposure to a TWA equal to or greater than 85 dBA must receive a baseline audiogram within six months of assignment. Subsequent audiograms will be compared to this baseline.
 1. An exception to this rule is where mobile test vans are used. In such cases, the employer must obtain a valid baseline audiogram within one year of the employee's first exposure at or above a TWA of 85 dBA. These employees must wear hearing protective devices until the baseline audiogram is obtained.
 2. Testing to establish a baseline audiogram must be preceded by at least 14 hours without exposure to workplace noise. This requirement may be met by wearing the appropriate hearing protective device.
 3. Employees must be notified of the need to avoid high levels of non-occupational noise exposure during the 14-hour period immediately preceding the audiometric examination.
- d. Periodic Hearing Tests.
 1. Each DOC employee whose exposures equal or exceed an 8-hour TWA of 85 dBA for shore operations and 82 dBA for shipboard operations must receive hearing test at least annually for as long as the employee is assigned to a noise hazardous environment.
 2. Each employee's annual audiogram must be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred. The comparison may be done by a qualified technician.
 - (a) If the annual audiogram shows that an employee has suffered a standard threshold shift, the employee must obtain a retest within 30 days and may consider the results of the retests of the annual audiogram.
 - (b) When a standard threshold shift occurs, unless the physician determines that it is not work related or aggravated by occupational noise exposure, the following steps shall be followed:

- (1) The employee shall be informed in writing, within 21 days, of the test results.
 - (2) An employee not using hearing protectors shall be fitted with such protection, trained in its use and care, and required to use it.
 - (3) An employee already using hearing protection shall be refitted and retained in its use.
 - (4) The employee shall be referred for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is deemed necessary by the physician.
 - (5) The employee is informed of the need for an otological examination if the physician finds a non work-related medical pathology.
- (c) The physician shall review problem audiograms and determine whether there is need for further evaluation. All pertinent medical data shall be considered when making this evaluation, i.e., hearing conservation requirements, baseline audiogram, recent audiogram, sound pressure levels, and audiometer calculations.
 - (d) An annual audiogram may be substituted for the baseline audiogram when, in the judgment of the audiologist or physician who is evaluating the audiogram:
 - (1) The standard threshold shift revealed by the audiogram is persistent; or
 - (2) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

In these cases a revised baseline audiogram is indicated. In addition, it should be noted that all audiograms must be retained for length of employment of the affected employee.

07. PERSONAL HEARING PROTECTIVE DEVICES

- a. Hearing protective devices must be worn by all personnel when they enter or work in an area where the operations generate noise levels of:
 1. Equal to or greater than 90 dBA sound level;
 2. Equal to or greater than 140 dB peak sound pressure level ; or
 3. A TWA equal to or greater than 85 dBA or a dose of 50 percent.

NOTE: There may be unique situations where noise levels rise unpredictably above 85 dBA for short durations so that the wearing of hearing protective devices may be judged impractical or unnecessary. Decisions to waive the use of hearing protective devices must not be made arbitrarily. Such professional judgments must be rendered by an industrial hygienist or other competent person considering all relevant factors.

- b. A combination of insert type and circumaural type (ear muffs) hearing protective devices (double

protection) must be worn in all areas where noise levels can not be attenuated to an acceptable level using a single type.

- c. All personnel exposed to gunfire in training situations or to artillery firing under any circumstances, must wear hearing protective devices.
- d. The determination of which hearing protective device or combination of devices, suitable for use in each situation, is the responsibility of the industrial hygienist or other competent person under the direction of an industrial hygienist, RSM or OUSHR. Every effort must be made to issue personal hearing protective devices suited to the location and duration of usage, following the guidance contained in Table 15-3. Personal hearing protective devices must reduce effective sound levels to less than 85 dBA or 140 dB peak.
- e. In cases where hearing protective devices do not provide sufficient attenuation to reduce the employee's effective exposure level below 85 dBA, administrative control of exposure time will be necessary.

08. PROCUREMENT OF EAR PROTECTIVE DEVICES

- a. Procedures for the procurement of hearing protective devices will vary among operating units. Hearing protective devices such as ear plugs and ear muffs must be made available at no cost to the employee and must be replaced as necessary, depending on the type and durability of the individual device.
- b. Audiometric testing services, to comply with the provisions of the Hearing Conservation Program must be procured in the most cost effective manner available. Where the Department has a contract with the U.S. Public Health Service for clinical services, the audiometric tests shall be included as part of the contract. At other locations, site managers are encouraged to contract for the audiometric tests with the nearest U.S. Public Health Service, Federal Employee Occupational Health Office, or the office of a local professionally qualified and certified audiologist, audiology technician, otolaryngologist, or physician.

09. EDUCATION AND TRAINING

- a. A comprehensive training program on the effects of noise on hearing and on the need for, and use of, hearing protective devices must be conducted at all sites with significant noise levels and where employees are enrolled in the Hearing Conservation Program. This training must be included in the training program for supervisors and non-supervisory personnel. All employees working in noise hazardous areas and/or who are required to wear hearing protective devices must be included in the training.
- b. The education program must be repeated annually for each employee enrolled in the Hearing Conservation Program.
- c. Each employee must receive training on the following:
 - 1. The effects of noise on hearing.
 - 2. The purpose of hearing protective devices and the advantages and/or disadvantages of various types.
 - 3. Instructions on the selection, fitting, use, and care of hearing protective devices.

4. The purpose of the audiometric testing, and an explanation of the test procedures.
- d. Copies of the OSHA standard 29 CFR 1910.95 and informational materials pertaining to the standard must be made available to all employees.

10. RECORDKEEPING

- a. Accurate records of all employee exposure measurements must be maintained for a period of 20 years following exposure measurements.
- b. Audiometric test records of employees must be maintained for the duration of the employee's employment. The audiometric test record must include the following information:
 1. Name and job classification of the employee.
 2. Date of the audiogram.
 3. The examiner's name.
 4. Date of the last acoustic or exhaustive calibration of the audiometer.
 5. The employee's most recent noise exposure measurement.
 6. Accurate records of the measurements of the background sound pressure levels in the audiometric test rooms.
- c. All records required by this chapter must be provided upon request to employees, former employees, the employee's representative, and safety and health personnel.

11. NOISE ABATEMENT PROGRAM

The primary means of protecting DOC employees from hazardous noise must be through the application of engineering controls. Administrative controls (i.e., the adjustment of work schedules to limit exposure) are also effective, but often result in some loss in productivity. Personal protective equipment must be the permanent solution only when engineering or administrative controls are considered to be infeasible or cost prohibitive.

- a. Preventive Measures. It is much less costly to eliminate potential noise problems in the design or procurement stage for new processes, equipment, and facilities than it is to make retrofits or modifications after the fact. To accomplish this, site plans, architectural designs and procurement of equipment must be reviewed and/or purchased to ensure sound levels of less than 85 dBA are achieved whenever possible.
- b. Abatement of Existing Noise Hazards. Abatement of hazardous noise levels shall be undertaken, to the extent possible or practicable, by one or more of the following methods:
 1. By engineering design to eliminate or reduce the noise levels of machinery, equipment, and other operating devices/facilities to acceptable levels;
 2. By damping the noise by means of lamination, mufflers, mountings, couplings, supports,

insulation or application of acoustic materials;

3. By acoustical enclosure of the noise producer;
4. By isolation of the noise producer so that the noise will affect fewer employees;
5. By substitution of less noisy operations (i.e., welding in lieu of riveting); or
6. By administrative controls which limit exposure (i.e., control of work schedules).

12. RESPONSIBILITIES

a. Site managers are responsible for:

1. Ensuring the establishment of a comprehensive Hearing Conservation Program, when required;
2. Ensuring all appropriate individuals are identified and participate in the Program;
3. Appointing a qualified person to oversee the program (generally, an industrial hygienist, ASR, or OUSHR with appropriate training is considered qualified); and
4. Ensuring that adequate funds are available to provide for noise monitoring, engineering controls, and procurement of examination services and hearing protection devices for all employees placed in the Hearing Conservation Program.

b. Supervisors are responsible for:

1. Informing the ASR of job conditions that are suspected of exposing employees to noise hazards;
2. Ensuring that all employees whose jobs require the wearing of hearing protection devices receive instruction in the selection, use, and maintenance of such equipment;
3. Ensuring employees are provided with and properly use required hearing protection devices; and
4. Taking appropriate action to implement and enforce the Hearing Conservation Program requirements discussed in this chapter.

c. Employees are responsible for:

1. Notifying their supervisor or ASR of conditions that could result in exposure to hazardous noise levels;
2. Obtaining and wearing appropriate hearing protection devices whenever required and in accordance with instructions and training received;
3. Participating in training sessions provided by the ASR;
4. Maintaining the hearing protective devices in a clean and sanitary condition; and
5. Notifying their supervisor when replacement devices are needed.

- d. ASRs or other qualified persons appointed to oversee the Hearing Conservation Program are responsible for:
1. Conducting a complete survey of all work areas, processes, and operations to identify hazardous noise areas. Conducting follow-up monitoring as required;
 2. Identifying and maintaining a roster on personnel placed in the Program;
 3. Determining if hearing protective devices are required based upon the nature and/or extent of noise hazards;
 4. Advising supervisors and users on proper selection of hearing protective devices;
- NOTE: In field locations, if the ASR requires assistance in determining the need for and the selection of hearing protective devices, the appropriate RSM or OUSHR should be contacted for guidance.
5. Providing training to supervisors and employees in the Hearing Conservation Program, as required; and
 6. Conducting random inspections to ensure that hearing protective devices are being properly used, maintained and stored.
- e. OUSHRs and RSMs are responsible for providing guidance to ASRs, managers, and employees on compliance with the Hearing Conservation Program.

TABLE 15-1
PERMISSIBLE NOISE EXPOSURES¹

Duration per day, hours	Sound Level dBA slow response
8.	90
6.	92
4.	95
3.	97
2.	100
1 ½.	102
1.	105
½.	110
1/4 or less	115

¹When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 \dots C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the time value. C_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

TABLE 15-2 NOISE EXPOSURE COMPUTATION

TABLE 15-2a CONVERSION FROM
"PERCENT NOISE EXPOSURE" OR
"DOSE" TO "8-HOUR TIME-WEIGHTED
AVERAGE SOUND LEVEL" (TWA)

Employee Noise Exposure	
A-wt. Sound level L(decibels)	Reference
80	32
81	27.9
82	24.3
83	21.1
84	16.4
85	16
86	13.9
87	12.1
88	10.6
89	9.2
90	8
91	7.0
92	6.1
93	5.3
94	4.6
95	4
96	3.5
97	3.0
98	2.6
99	2.3
100	2
101	1.7
102	1.5
103	1.3
104	1.1
105	1
106	0.87
107	0.76
108	0.66
109	0.57
110	0.5
111	0.44
112	0.38
113	0.33
114	0.29
115	0.25
116	0.22
117	0.19
118	0.16
119	0.14
120	0.125
121	0.11
122	0.095
123	0.082
124	0.072
125	0.063
126	0.054
127	0.047
128	0.041
129	0.036
130	0.031

In the above table the reference duration, T1 is computed by

$$T = \frac{8}{2(L-90)/5}$$

where L is the measured A-weighted sound level.

In order to convert the reading of a dosimeter into TWA, see Table 15-2a. This table applies to dosimeters that are set by the manufacturer to calculate dose or percent exposure according to the relationships in Table 15-2. So, for example, a dose of 91 percent over an eight-hour day results in a TWA of 89.3dB, and, a dose of 50 percent corresponds to a TWA of 85 dB.

Dose or percent noise exposure	TWA
10	73.4
15	76.3
20	78.4
25	80.0
30	81.3
35	82.4
40	83.4
45	84.2
50	85.0
55	85.7
60	86.3
65	86.9
70	87.4
75	87.9
80	88.4
81	88.5
82	88.6
83	88.7
84	88.7
85	88.8
86	88.9
87	89.0
88	89.1
89	89.2
90	89.2
91	89.3
92	89.4
93	89.5
94	89.6
95	89.6
96	89.7
97	89.8
98	89.9
99	89.9
100	90.0
101	90.1
102	90.1
103	90.2
104	90.3
105	90.4
106	90.4
107	90.5
108	90.6
109	90.6
110	90.7
111	90.8
112	90.8
113	90.9
114	90.9
115	91.0
116	91.1
117	91.1
118	91.2
119	91.3
120	91.3
125	91.6
130	91.9
135	92.2
140	92.4
145	92.7
150	92.9
155	93.2
160	93.4
165	93.6
170	93.8
175	94.0
180	94.2
185	94.4
190	94.6
195	94.8
200	95.0
210	95.4
220	95.7
230	96.0
240	96.3
250	96.6

TABLE 15-2a Cont.

Dose or percent noise exposure	TWA
260	96.9
270	97.2
280	97.4
290	97.7
300	97.9
310	98.2
320	98.4
330	98.6
340	98.8
350	99.0
360	99.2
370	99.4
380	99.6
390	99.8
400	100.0
410	100.2
420	100.4
430	100.5
440	100.7
450	100.8
460	101.0
470	101.2
480	101.3
490	101.5
500	101.6
510	101.8
520	101.9
530	102.0
540	102.2
550	102.3
560	102.4
570	102.6
580	102.7
590	102.8
600	102.9
610	103.0
620	103.2
630	103.3
640	103.4
650	103.5
660	103.6
670	103.7
680	103.8
690	103.9
700	104.0
710	104.1
720	104.2
730	104.3
740	104.4
750	104.5
760	104.6
770	104.8
780	104.9
790	104.9
800	105.0
810	105.1
820	105.2
830	105.3
840	105.4
850	105.4
860	105.5
870	105.6
880	105.7
890	105.8
900	105.8
910	105.9
920	106.0
930	106.1
940	106.2
950	106.2
960	106.3
970	106.4
980	106.5
990	106.5

TABLE 15-3
POSITIVE AND NEGATIVE FEATURES OF
HEARING PROTECTIVE DEVICES

TYPE	POSITIVE	NEGATIVE	DURATION
Insert Single Flange Triple Flange	After adaptation, can be used for long periods. Relatively inexpensive.	Individual fitting by medical personnel required. Frequent irritation	Long term (3-4 hours)
Headband Ear Caps Sound-Ban	Quickly fitted without touching ear canal. Easily carried.	Uncomfortable after one hour.	Short term. Frequently off/on.
Disposable Silaflex Ear Deci-Damp	Comfortable. Individual fitting not required. Relatively inexpensive.	Molded by hand. Easily soiled. Difficult to clean.	Infrequent use. Transitory noise exposure.
Circumaural Muffs Type I & II	May be worn over plugs. Most efficient universal device.	Expensive. Heavy. Difficult to carry. Hair or eyeglasses may reduce effectiveness.	Long or short term.

One single type of hearing protective device will not meet the needs of all personnel in a Hearing Conservation Program. The appropriate type of hearing protective device should be selected based upon a consideration of the factors listed above in addition to the degree of attenuation required in a particular situation. The most convenient method of estimating the degree of attenuation is the Noise Reduction Rating (NRR) developed by the Environmental Protection Agency (EPA). The NRR is usually shown on the hearing protector package. The NRR is then compared to an individual work's noise environment in order to assess the adequacy of the attenuation of

a given hearing protector.

CHAPTER 16

CONFINED SPACE ENTRY PROGRAM

01. DISCUSSION

- a. The DOC policy is that a Confined Space Entry Program which complies with this chapter and 29 CFR 1910.146 must be implemented at a site before entry into a confined space is attempted. No person shall enter any closed compartment or poorly ventilated space unless a confined space entry program has been developed and complied with and the danger of poisoning, suffocation, or ignition of flammable gases have been eliminated or reduced to the lowest practical level and the qualified person has issued a certificate allowing entry. All employees associated with confined space entry must be trained to recognize the hazards associated with this work. Supervisors must ensure that the requirements of the Confined Space Entry Program in this chapter have been followed.
- b. A confined space is an enclosed space, which because of its small size and confined nature, can readily create or aggravate an exposure to a hazardous condition. A confined space is large enough and so configured that employee can bodily enter and perform work; has limited or restricted openings for entry and exit; has one or more of the following: contains or has potential to contain a hazardous atmosphere, contains material with the potential for engulfment of the entrant, has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross section or contains other recognized serious safety or health hazards; and is not intended for continuous employee occupancy.
- c. In enclosed space is a space enclosed on the sides and overhead by walls or bulkheads. An enclosed space may or may not also be classified as a confined space.
- d. Most of the fatalities in confined spaces occur because the atmosphere within the confined space is either oxygen-deficient or toxic. Testing, evaluating, and monitoring the atmosphere within the confined space is critical. Improper work practices and procedures for emergencies and rescue operations contribute to the number of fatalities associated with confined space work.
- e. Workers in many occupations may be required to enter confined spaces. Typical confined spaces include but are not limited to sewer lines, tanks (septic tanks, holding tanks, storage tanks), silos, vats, ducts, underground utility vaults, reaction vessels, boilers, pits, compartments of ships, ventilation and exhaust ducts, tunnels, and pipelines. Employees of DOC may be required to enter these types of spaces in the normal course of their work.

02. RESPONSIBILITIES

- a. **Site managers/supervisors** are responsible for:
 - 1. Establishing a written Confined Space Entry Program for their specific operations where entry into a confined space is anticipated.

2. Ensuring that the requirements of the Confined Space Entry Program are followed prior to entry into any confined space.
 3. Training all employees who may be involved in confined space entry in the hazards associated with their duties and responsibilities before entry into a confined space.
 4. Appointing a qualified person to oversee the program and to ascertain that the requirements of the program have been met prior to entry into a confined space.
 5. Determining the need to enter Class A confined spaces.
- b. **Entrant** is responsible for:
1. Complying with the requirements of the Confined Space Entry Program.
 2. Wearing required personal protective equipment while within confined space.
 3. Maintaining contact with an attendant while inside the confined space.
 4. Responding appropriately to a personal monitor alert.
- c. The **qualified person** is responsible for:
1. Testing and evaluating all confined spaces prior to authorizing entry. Recertifying the space after work interruptions.
 2. Issuing the permit for work within the confined space.
 3. Coordinating all work within confined spaces at a site.
 4. Ensuring all test equipment is maintained and calibrated.
 5. Evaluating the confined space and surrounding area. Developing engineering methods to control hazards associated with the operations.
 6. Notifying the rescue team supporting a confined space emergency response prior to commencing work in a confined space, to insure availability and capability.
- d. The **attendant** is responsible for:
1. Monitoring entry and departure of authorized persons into the confined space.
 2. Monitoring conditions (atmosphere, employees, progress of work) within the confined space while employees are inside the space.
 3. Initiating the alert for emergency and rescue operations or commencing rescue from outside the space.
 4. Remaining outside the confined space at all times.
 5. Controlling the work site by posting and/or barricading.

03. CONFINED SPACE ENTRY PROGRAM REQUIREMENTS

a. Recognition and Testing.

1. Evaluation.

- (a) Prior to commencing work in a space, an evaluation shall be made as to whether the space meets the definition of a confined space. (Refer to Section I(b) of this chapter or the glossary).
- (b) The characteristics of the space should be evaluated for ventilation potential, entry and exit points, equipment inside the space whether operating or not, and the need to isolate the space from other energy sources prior to entry.

2. Testing.

- 2. If the space meets the definition of a confined space, testing of the atmosphere within the space must be conducted prior to allowing any employees to enter the space.
- (b) Initial testing of the atmosphere within the confined space shall be conducted from outside of the space.
- (c) Testing shall be conducted for oxygen content, flammability hazard through testing for the percent of the L.E.L (lower explosive limit) present, and carbon monoxide. In addition, if it is suspected that other contaminants may be present, tests shall be conducted for those suspected contaminants. Some frequently encountered contaminants include but are not limited to aromatic hydrocarbons, Freon, hydrocyanic acid, hydrogen sulfide, nitrogen dioxide, carbon dioxide, sulfur dioxide, and ammonia.

b. Evaluation and Monitoring.

- 1. Once testing has been conducted, the results should be compared against the established limits for the various contaminants tested. An adequate number of tests should be taken to determine the level of atmospheric substances relative to the respective Permissible Exposure Limits (PEL). Because some PEL are also ceiling values, samples must be taken to determine peak concentrations during various phases of the entire operation.
- 2. Based on the results for oxygen content, flammability, and toxicity, and the characteristics of the space, the space shall be classified as a Class A, B, or C confined space.
 - (a) A Class A confined space is one in which any of the hazards identified present a situation which is immediately dangerous to life and health (IDLH). Any space with an oxygen deficient atmosphere is a Class A space.
- 2. A Class B confined space is one in which the potential for injury and illness exists but is not immediately dangerous to life and health.

- (c) A Class C confined space is one in which the hazard potential for injury or illness would not require any special modification of the work procedure.
- 3. The classification shall be made based on the most hazardous conditions expected while entering, working in, and exiting the confined space.
- 4. Continuous monitoring of the space while the work is being performed is required for a Class A and B confined space and may be necessary for a Class C space. The need for additional monitoring of a Class C space shall be determined by the qualified person. Monitoring in Class C is mandatory when work procedures effect the atmosphere. Personal monitors provide continuous monitoring.
- c. Establishment of Work Procedures and Practices.
 - 1. Entry into a confined space requires careful preparation. Table I provides a check list of items to consider when entering, working in, and exiting confined spaces. If necessary, the area surrounding the confined space operation should be posted and barricaded to prevent unnecessary traffic and warn other personnel of the operation. Refer to 29 CFR 1926.251. Consideration of all items in the check list and completion of the "permit" is required prior to entry into a confined space.
 - (a) Entry into a Class A confined space is not recommended. The highest level supervisor/site manager at facility must be involved in the decision process prior to authorizing work under these critical conditions. Classification is based on one of the following conditions: the space cannot be ventilated sufficiently to produce an oxygen content above 16 percent and/or reduce the toxic and flammable conditions below the IDLH limits. Respiratory protection is required when entering a Class A confined space.
 - (b) Entry into a Class B or Class C space is allowed provided the proper precautions have been taken prior to entry into the space.
 - 2. Entry into a confined space shall not be allowed until an authorization and approval in writing has been issued. This authorization shall be called a "permit".
 - (a) The permit shall be signed and dated by the qualified person, specify the location and type of work to be performed, and certify that the existing hazards have been evaluated and protective measures implemented to insure the safety of each person entering the confined space. A sample permit is shown in Appendix I and may serve as a guide. This document or a similar document that contains the same information must be completed prior to entry into a confined space.
 - (b) The permit must specify that the following areas and actions have been reviewed and confirmed.
 - (1) Location and description of the work to be done.
 - (2) Hazards that may be encountered.

- (3) Isolation checklist has been completed:
 - A. Blanking and/or disconnecting.
 - B. Electrical and/or mechanical lockout.
- (4) Special clothing and equipment obtained:
 - A. Personal protective equipment and clothing.
 - B. Safety harness and/or lifelines.
 - C. Tools approved for use in accordance with the Hazardous Location Classification (NEC-1078) obtained.
 - D. Approved electrical equipment obtained.
- (5) Atmospheric testing has been conducted for:
 - A. Oxygen level.
 - B. Flammability and/or explosive levels.
 - C. Toxic substances levels.
- (6) Atmospheric monitoring while work is being performed:
 - A. On continuous basis.
 - B. As determined by the qualified person.
- (7) Personnel training completed with complete understanding of the hazards and the work to be accomplished within the space.
- (8) Attendant person(s) named.
- (9). Emergency procedures established and location of first aid equipment identified.
- (10) Determination of confined space classification as Class A, B, or C.
- (11) Name of person entering space with time in and out.
- (c) The permit shall be valid for one work shift only. If the work to be accomplished takes longer than one work shift, then the conditions must be re-evaluated, the permit updated if necessary, and then reissued.
- (d) The permit shall be posted in a conspicuous place close to the entrance to the confined space while the work is ongoing.

- (e) Upon completion of work, the permit is filed for three years.
- 3. Work procedures for the work to be performed within the confined space shall be established prior to entering the space.
 - (a) The number of employees needed to perform the work and the equipment and tools needed shall be determined.
 - b. Protective equipment needed shall be identified and obtained. Respiratory protection is required for a Class A space.
 - (c) The need to ventilate the space shall be determined and the space purged with sufficient fresh air to reduce the levels of contaminants to an acceptable limit. Any activities which may alter the oxygen content in the space shall be determined and provisions made to ensure that the activities in the space do not create an IDLH atmosphere while employees are working within the space.
 - (d) Any equipment in the space, whether operating or not, shall be isolated, locked and tagged out, so that it cannot be reactivated while people are within the confined space.
 - (e) Communications between the people inside the confined space and the support people outside the space shall be established.
 - (f) One person shall be designated as the **attendant**.
 - (1) The **attendant** shall control the entry and exit of employees within the confined space.
 - (2) The **attendant** will continuously observe conditions within the confined space and coordinate the communications between the people within the confined space and outside the space.
 - (3) The **attendant** shall summon the rescue team when upon observation of conditions inside the confined space, a rescue is necessary.
 - (4) At no time shall the **attendant** attempt to rescue people by entering the confined space.
 - (g) Rescue procedures shall be established, and respiratory protection for rescue personnel must be readily available within the immediate area of the confined space. Rescue of employees from the confined space must not be attempted unless the rescue personnel are properly equipped with respiratory protection in the form of self-contained breathing apparatus or supplied air mask. Rescuers should be prepared for atmospheres on level above the one indicated on the permit.
- d. Rescue Procedures.
 - 1. Each site having confined spaces shall determine whether to rely on an in-house rescue

team or to establish an arrangement with an outside rescue team which will respond to a request for emergency services. The outside rescue team may be obtained through the use of "911" emergency services where available or through the local fire department.

- (a) The **attendant** shall monitor operations inside the confined space and summon the rescue team when required. At no time shall a rescue requiring entry into the confined space be attempted by the **attendant** or other non-qualified person at the site. Multiple fatalities have occurred in confined spaces because a rescue was attempted by non qualified and trained personnel. Remember, a "dead hero" is not a hero.
- (b) If an in-house rescue team is used, provisions shall be made to ensure that:
 - (1) The personnel assigned to the rescue team are provided with the personal protective equipment, including respiratory protection (self-contained breathing apparatus or air supplied mask), necessary for making rescues from the confined spaces at the site, and are trained in the use of the respiratory protection. Rescue team protection must exceed worker protection.
 - (2) The in-house rescue team is readily available to be summoned whenever work is scheduled inside a confined space.
 - (3) The in-house rescue team is trained to perform rescue operations and has received the same training as those employees who have been authorized to enter the confined space to perform the work.
 - (4) The in-house rescue team must practice making rescues from confined spaces at least once per year. The practice rescue must simulate rescue conditions and use dummies, mannequins or personnel in a simulated rescue operation. The simulated rescue conditions shall approximate as closely as possible the conditions that would exist at the site in a confined space, including the size of openings and configuration of a confined space.
 - (5) At least one member of the in-house rescue team, and preferably two members, must be trained and maintain current certification by the American Red Cross in basic first-aid and cardiopulmonary resuscitation (CPR) skills.
 - (6) The number of members of the rescue team that enter the confined space to rescue the injured employees will depend on the number of employees to be rescued. If only one person needs rescue, only one member of the rescue team shall enter the confined space. Any additional members of the rescue team will remain outside the confined space and assist the rescue operation, and will enter the confined space only if additional help is summoned by the first rescue team member.
- (c) If an outside rescue team is used, the site manager must ensure that the designated rescuers are aware of the hazards that might be encountered during

a rescue operation at the site. Confined space entry can only occur if the local team can provide emergency support.

e. Medical Surveillance.

1. A medical surveillance program shall be established for all employees who, Within the scope of their work assignments and duties, enter into and work within Class A or B confined spaces.
2. The medical surveillance program shall consist of a pre-placement medical examination and a periodic (yearly) medical examination for all employees who enter and work within confined spaces. The medical examination shall include:
 - (a) A general evaluation of the employee's health and the detection of any diseases or abnormalities that would make it difficult for the employee to work within confined spaces.
 - (b) An evaluation of the employee's ability to use and wear negative and positive pressure respirators while performing work.
 - (c) A hearing exam, a vision test and an evaluation of the employee's ability to hear and see warning lights and signals, such as flashing lights, buzzers, and sirens.
3. Prior to conducting the medical examination, the attending physician shall receive a description of the type of confined space the employee may be required to enter, the type of substances that may be encountered, and the type of protective equipment, including respirators, that may be required to be worn.
4. Following completion of the medical examination, the attending physician shall provide a written report to the site manager. The report shall specify the general condition of the employee's health and whether the employee may continue to work within confined spaces without an increased risk to the employee's health.
5. All details of the physician's reports to the site manager must be kept confidential.

f. Training.

1. Training must cover the duties of the three categories of workers involved in confined space work: entrants, attendants, and individuals in charge of entry or responsible for authorizing permits. Refer to Rescue Protection for rescue team training requirements.
 - (a) Entrants training must cover hazard recognition, communications procedures, protective equipment and self rescue.
 - (b) Attendant training must include the procedures used to keep account of entrants, hazard recognition, communications techniques, and rescue methods.
 - (c) Qualified persons are required to be trained in calibrating and using monitoring equipment, determining appropriate engineering methods to remediate the hazards, determining the severity of the hazards, developing an entry plan, training entrants and attendants.

- (d) Individuals may be trained in several worker categories. On the job site an individual will perform only one function except the qualified person can be an entrant or an attendant.
- 2. Training should be documented on employee safety and health record or documents used for safety training.
- g. Recordkeeping. Records must be retained for the following time periods:
 - 1. Atmospheric tests - 5 years.
 - 2. Training - 3 years.
 - 3. Permits - 3 years.
 - 4. Medical examinations - 25 years.
 - 5. Monitoring data - 25 years, if at or above the Action Level.

04. INSTRUMENTS

- a. Supervisors shall ensure testing and monitoring equipment used in confined spaces is approved for use in Class 1, Division 1 locations.
- b. Only direct reading equipment with current calibration will be used.
- c. Equipment should meet certifications by Underwriters Laboratories (UL), factory mutual (FM), or a similar nationally recognized test laboratory.
- d. Group classification is provided in National Fire Protection Association (NFPA) 497M, Manual for Classification of Gases, Vapors, and Dust for Electrical Equipment in Hazardous Locations. Guidance is also provided in National Materials Advisory Board (NMAB) 353-5, Classification of Gases, Liquids and Volatile Solids Relative to Explosion-proof Electrical Equipment.
- e. Equipment should be kept calibrated. The user shall field check equipment according to the manufacturer's instructions immediately before testing the confined space atmosphere.
- f. Monitoring instruments which cannot be calibrated or which fail the field check will be removed from service. Equipment will be returned to service after repairs are completed and the calibration and field check are successfully accomplished.
- g. Instruments used for evaluating confined spaces are:
 - 1. Oxygen sensors.
 - 2. Explosive meters.
 - 3. Toxic chemical detectors.
 - 4. Multipurpose personal monitors.

05. HOTWORK

- a. The supervisor will ensure the proper fire-fighting equipment is available and ready to use whenever hot riveting, welding, cutting, brazing, or heating operations occur within a confined space. The supervisor will ensure that local emergency medical services is informed of confined space project and hot work operation.
- b. Inspect, test, operate and maintain welding and cutting equipment such as hoses, connections, torches, and manifolds according to industry practices and OSHA standards.
- c. Gas cylinders and manifolds used in welding and cutting operations and electric arc units or machines must remain outside of the confined space at all times.
- d. Turn off gas supplies at the cylinders or manifold outside the space when equipment is unattended or unused for substantial periods of time, such as breaks or lunch periods. Turn off gas supplies and remove torches and hoses from the space at shift changes (30 minutes or more) or overnight. Torches should be disconnected from the hoses when not in use.

06. PURGING/VENTILATION

- a. When initial testing indicates that ventilation is required to remove dedicated contaminant and/or provide adequate oxygen levels, the supervisor will ensure ventilation is provided during entry and occupancy of the space.
- b. Operations to be conducted inside the confined space have the potential to cause an Immediately Dangerous to Life or Health (IDLH) atmosphere without industrial ventilation, the supervisor will ensure ventilation (general dilutions or local exhaust is used to maintain the atmosphere within the space).
- c. Ventilation equipment should have approved Ground Fault Interrupter (GFI) protection and, if equipment is to be in a Class A or B environment, it should be protected by explosion-proof fixtures in accordance with the National Fire Prevention Administration (NFPA).

07. LOCKOUT/ISOLATION

- a. The lockout/tagout procedures should be in the planning phase of all confined space operations.
- b. Procedures should be followed in accordance with OSHA regulations.
- c. All personnel performing in the confined space operation project should be informed and trained in the lockout/tagout program.

08. CONTRACTOR INVOLVED IN CONFINED SPACE ENTRY

- a. Prior to awarding a contract, contract review should evaluate the confined space entry program for compliance with OSHA regulations or state safety and health standards.
- b. Contractors should post the area and provide barricades if necessary. Their project should not damage DOC property or injure DOC personnel.

**CHECK LIST OF CONSIDERATIONS FOR ENTRY,
WORKING IN AND EXITING CONFINED SPACES**

ITEM	CLASS A	CLASS B	CLASS C
1. Permit	X	X	X
2. Atmospheric Testing	X	X	X
3. Monitoring	X	0	0
4. Medical Surveillance	X	X	0
5. Training of Personnel	X	X	X
6. Labeling and Posting	X	X	X
7. Preparation			
Isolate/lockout/tag	X	X	0
Purge and ventilate	X	X	0
Cleaning Processes	0	0	0
Requirements for special equipment/tools	X	X	0
8. Procedures			
Initial plan	X	X	X
Standby	X	X	0
Communications/observation	X	X	X
Rescue	X	X	X
Work	X	X	X
9. Safety Equipment and Clothing			
Head protection	0	0	0
Hearing protection	0	0	0
Hand protection	0	0	0
Foot protection	0	0	0
Body protection	0	0	0
Respiratory protection	0	0	
Safety Belts	X	X	X
Life lines, harness	X	0	
10. Rescue Equipment	X	X	X
11. Recordkeeping/Exposure	X	X	

X - indicates requirement

0 - indicates determination by the qualified person

TABLE I
CONFINED SPACE CLASSIFICATION TABLE

Parameters	Class A	Class B	Class C
Characteristics	immediately dangerous to life - rescue procedures require the entry of more than one individual fully equipped with life support equipment - maintenance of communication requires an additional standby person stationed within the confined space.	dangerous, but not immediately life threatening - rescue procedures require the entry of no more than one individual fully equipped with life support equipment indirect visual or auditory communication with workers.	potential hazard requires no modification of work procedures - direct communication with workers from outside the confined space.
Oxygen	16% or less *(122 mm Hg) or greater than 25%.		

CONFINED SPACE ENTRY PERMIT

INITIAL CERTIFICATION			TEST RESULTS				
ACTIVITY ADDRESS:			TESTS CONDUCTED AS REQUIRED	PEL	INITIAL TEST	RETEST 1	RETEST 2
			OXYGEN				
			COMBUSTIBLE GAS				
TYPE OF OPERATION TO BE CONDUCTED:			TOXIC TYPE:				
			TOXIC TYPE:				
			TOXIC TYPE:				
DESCRIBE CONFINED SPACE:			TOXIC TYPE:				
			VENTILATION REQUIRED: YES NO TYPE:				
INITIAL DATE OF TEST: HOUR _____ DATE _____			ENTRANTS: _____ TIME: _____ IN _____ OUT _____ IN _____ OUT _____ IN _____ OUT _____				
INITIAL EXPRATION: HOUR _____ DATE _____							
HOTWORK							
LOCATIONS	NAME	SIGNATURE* (UPON COMPLETION)	NOTE: THIS INSPECTION INDICATES THE CONDITIONS WHICH EXISTED AT THE TIME TESTS WERE CONDUCTED. QUALIFIED PERSON SIGNATURE: _____				
			RECERTIFICATION				
TIME COMPLETED: _____ * FINAL CHECKUP: WORK AREA AND ALL ADJACENT AREAS TO WHICH SPARKS & HEAT MIGHT SPREAD WERE INSPECTED 30 MIN. AFTER THE WORK WAS COMPLETED AND WERE FOUND TO BE FIRE SAFE. THE EQUIP. AND STRUCTURES WORKED ON WERE COOL TO THE TOUCH. I CERTIFY THAT I AM FAMILIAR WITH AND WILL COMPLY WITH ALL SAFETY PRECAUTIONS PERTINENT TO THIS TYPE OF WORK. HOTWORK OPERATOR SIGNATURE _____ HOTWORK SUPERVISOR _____			1ST RETEST/UPDATE TIME: _____ DATE: _____ EXPIRES: _____ QUALIFIED PERSON SIGNATURE: _____ 2ND RETEST/UPDATE TIME: _____ DATE: _____ EXPIRES: _____ QUALIFIED PERSON SIGNATURE: _____				

PERMIT TERMINATION

THIS CERTIFIES THAT ALL ENTRANTS HAVE VACATED THIS SPACE. THIS PERMIT IS VOID

ATTENDANT SIGNATURE _____

TIME: _____

DATE: _____

CHAPTER 17

INFECTIOUS WASTE

01. POLICY AND DISCUSSION:

The purpose of this chapter is to provide information to Department of Commerce employees who work with potentially infectious agents. The chapter includes specific precautions and procedures designed to eliminate or control the hazards.

Increasing attention is being directed toward safety as more workers are exposed to potentially infectious wastes. Exposure to these agents may pose special disease risks to workers in research laboratories, health care settings, and animal handling facilities. Disease may include Hepatitis B (HBV), Tuberculosis (TB), and Acquired Immunodeficiency Syndrome (AIDS). The route of these infections can vary, from inhalation of an aerosol, to ingestion, to injection with a contaminated needle. The focus must be on prevention of these infections through the practice of containment and other requirements of this document.

The requirements of this chapter apply to all Department of Commerce activities that involve work with biohazardous agents. Operating units must adopt similar or more stringent regulations.

02. ELEMENTS OF CONTAINMENT:

The purpose of containment is to eliminate/minimize personnel exposure to biohazardous agents and the escape of these agents into the environment.

Protection of personnel and the immediate environment is considered primary containment, and is achieved by good working techniques and the proper use of equipment.

Secondary containment is protection of environment outside biohazardous sites and is provided by a combination of operational practices and facility design. Three elements of containment are:

- a. **Laboratory Practice and Technique.** Strict adherence to standard practice and techniques is required to prevent contact with biohazardous agents. Typical incidents include spills or sprays; incidents involving needles, syringes, contaminated glass or other sharp objects; aspiration through pipettes; and bites or scratches of animals. Minimizing/eliminating the potential for these and other laboratory accidents when handling biohazardous agents can be achieved by:
 1. Limiting laboratory access when experiments involving biologicals/infectious agents are in progress;
 2. Posting a warning sign (see Figure #1) on the access door incorporating the international biohazard symbol when infectious agents are in use and require special provisions for entry.
 - (a) The sign shall name the agent, the name and telephone number of the responsible supervisor, and any requirements for entering the lab (protective

equipment, immunizations).

- (b) The sign is appropriate for use on freezers, refrigerators, and other approved storage medium housing biohazardous material.

3. Procedures shall be performed carefully to minimize the creation of aerosols. Enclosure of equipment and isolation of aerosol producing processes will serve to control the spread of aerosols.
4. Work surfaces shall be decontaminated once a day and after any spill, viable or potentially infectious biohazard.
5. Mechanical pipetting devices shall be used. Mouth pipetting is prohibited.
6. Consideration shall be given to the use of plastic items, blunt ends needles, rounded scissors, etc., for lab use with biohazardous agents to minimize "sharps".
7. Use of needles and syringes should be limited to situations in which there is no alternative. Needle-locking hypodermic syringes should be used whenever possible. Use of syringes for making dilutions is to be discouraged.
8. Use of alcohol-soaked gauze pad around the needle when removing the syringe and needle from a rubber-stoppered bottle will minimize aerosol production. Needles should be disposed of immediately after use and never left where they can cause injury to others.
9. Keep needle and syringe units intact (never recap, break or bend needles) and dispose of in a puncture resistant, leak proof container kept as close as practical to the use area.

NOTE: Especially designed containers for needles, scalpels, and other sharps contaminated with biohazardous materials are available and may be obtained with assistance from your Operating Unit Safety Representative, Regional Safety Manager, or Area Safety Representative. Use of the specially designed containers is required.

10. Needles, scalpels and other "sharps" used with non-biohazardous or non-infectious materials shall be disposed of in approved sharps containers.
11. For disposal purposes, only those needles, syringes, and sharps exposed to infectious material shall be processed as biohazardous waste. Items used in laboratory analysis and not exposed to infectious material shall be disposed of in accordance with State or Federal regulations for the disposal of such material.
12. Before centrifuging, check tubes for damage. Never over-fill centrifuge with tubes.
13. Hand to face contact must be minimized. Eating, drinking, chewing gum or tobacco and applying cosmetics shall be prohibited in rooms where biohazardous materials are used.
14. Wash hands thoroughly after handling biohazardous materials and before leaving the laboratory or other biohazardous materials environment. Soap shall be of the

dispensed liquid gel variety to eliminate the spread of infectious agents possible with bar soap.

15. Spills shall be taken care of promptly and properly.
 16. Biohazardous materials shall be stored only in specially designated areas such as properly labeled refrigerators, freezers or incubators. There shall be limited access to these areas and log books shall be maintained for each.
 17. Cabinets or refrigerators storing biohazardous materials shall not be used for the storage of food. Food shall only be stored outside of the work area.
 18. Decontaminate all non-disposable contaminated materials before washing, reusing, repairing, or removing, typically by chemical disinfection (See Attachment A) or steam sterilization (autoclaving). Autoclaving is time and temperature dependent, and appropriate indicators must be used to ensure sterilization has taken place.
 19. Biohazardous agents transported outside the designated environment shall be transported in an impermeable, unbreakable, leak proof, labeled container.
- b. **Safety Equipment (Primary Barriers).** Biological Safety Cabinets (BSCs) are the principal devices of containment. Three classes of cabinets (I, II ,III) are available, with Class III offering the highest level of protection. When used with the work practices previously described, these cabinets offer significant levels of protection to personnel and the environment by isolating the hazard and containing the spills, splashes and aerosols.
- In situations where cabinet work is not possible, personal protective equipment may be the primary barrier between biohazardous agents and personnel. Their use is required whenever hazards that are capable of causing injury through inhalation, absorption or contact. These devices are often used in conjunction other primary barriers. Double gloving should be considered, as appropriate. Face shields shall be worn during procedures that have the potential for generating splashes.
- c. **Facility Design (Secondary Barrier).** Facility design is crucial in protecting personnel who work in and outside the lab, as well as those within the community. Facility designs, in ascending order by level of containment, are described below.

Design 1. The basic site provides general space where work is done with viable materials not associated with disease in healthy adults and/or work is done with infectious or potentially infectious materials when hazard levels are low and good lab techniques prevail; work is usually done on the open bench, but certain procedures are restricted to biological safety cabinets.

Design 2. The containment site includes special engineering controls that allow workers to handle infectious materials without presenting hazards to personnel, the environment, or the community; site is separated from public areas by a controlled access zone; a specialized ventilation system is present; vacuum line filters/disinfectant traps are used between the line and the operation to prevent contamination of the vacuum system.

Design 3. The maximum containment site, it has containment and engineering features that allow work with extremely hazardous, infectious materials capable of causing serious disease; often a separate building; secondary barriers are required, such as airlocks,

shower and change room, separate ventilation system, exhaust air decontamination system, and waste treatment system.

03. BIOSAFETY LEVELS

Biosafety Level 1 covers work done with defined agents not known to cause disease in healthy human adults. A representative of agents assigned to this level is **bacteria**.

Biosafety Level 2 contains work with indigenous, moderate-risk materials associated with human disease of varying severity. Primary hazards to personnel may include skin or mucous membrane exposure, ingestion and accidental inoculation. High aerosol-potential procedures must be confined to a Biohazardous Safety Cabinet. **Food poisoning and HBV and HIV virus** are assigned to this containment level.

Biosafety Level 3 techniques, equipment and facilities apply to clinical, teaching, diagnostic, research or production facilities where work is with exotic agents. Potential for infection by aerosols, ingestion or autoinoculation is real and may result in serious or lethal disease. **Tuberculosis** falls within this level.

Biosafety Level 4 covers work with exotic and dangerous agents with high risk of exposure and infection resulting in life-threatening disease. All manipulations present a high exposure risk.

04. MEDICAL UNIT ACTIVITIES

Rubber gloves shall be worn by all medical unit staff members who come in direct contact with patients, dressings, bandages or clothing containing a patients blood or serum.

Syringes and needles used in the administration of allergy injections shall be disposed of in a puncture-proof/leak-proof container. The container shall be located in the immediate area where the injections are administered.

Contaminated materials shall be disposed of either by autoclaving or by incineration, as appropriate.

05. MEDICAL SURVEILLANCE

Medical evaluation and surveillance shall be provided for groups of employees whose work requires them to perform tasks with a potential for skin or mucous membrane contact with blood, blood products, body fluids or human tissue. Surveillance consists of biennial physical examination and an annual blood screening for HBV antibodies.

In addition HBV immunization shall be offered to all workers exposed to blood/tissue who test negative for HBV antibodies. Screening and immunization costs shall be borne by the operating unit to which the employee is assigned.

Supervisors of groups described above but not currently in the medical surveillance program should be advised to contact their operating Unit Safety Representative, their Area Safety Representative or their Regional Safety Manager to discuss inclusion into the program.

06. PATIENT CARE

The Center for Disease Control (CDC) has published a report entitled "Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and other Bloodborne Pathogens in Health-Care Settings". A copy of CDC's report is attached and shall be implemented by all Department of Commerce Health Units and Fire Protection Services in the course of patient care.

07. PACKAGING/SHIPPING

- a. Packaging, labeling and shipping shall be in accordance with applicable Federal, state or local regulations and shall be coordinated with the site safety representative.
- b. At a minimum, bandages, swabs and other disposable potentially biohazardous materials shall be placed inside a double plastic bag, each of at least .6 mil of thickness.
- c. Each plastic bag shall be closed using a heavy duty tape (duct tape) and fastened so that the bag and its cargo is secure.

08. EMERGENCY PROCEDURES

- a. Spills. Each site supervisor in which biohazardous materials are used or stored shall develop a material-specific plan for handling spills. Stock solutions of appropriate disinfectant shall be maintained at each area housing biohazardous material. In case of an accident outside a Biological Safety Container resulting from breakage or spillage, affected employees shall:
 1. Remove any contaminated clothing and change into emergency clothing maintained in the lab;
 2. Leave the room closing the door;
 3. Warn others of the hazard; and
 4. Notify their supervisor and the site safety representative.

If the agent is infectious or potentially infectious, the appropriate Emergency Control Center (site, County or State) must be notified in a timely manner. Work in the laboratory shall be suspended and decontamination performed prior to reoccupancy or continuation of work. Clean-up or decontamination plans shall be developed by the supervisor of the laboratory and a copy provided to the Safety Representative.

- b. Accidental Exposure. An employee who is accidentally exposed to an infectious agent shall immediately report the incident to their immediate supervisor. In the event that a substance enters the mouth, eyes, lungs or penetrates or comes in contact with the skin, the supervisor shall direct disinfecting procedures and see that the employee reports for medical treatment immediately. The Medical Officer or designee will take appropriate action to provide medical evaluation, surveillance and treatment as needed.

09. INFECTIOUS WASTE CONTROL AND DISPOSAL

- a. Waste biohazardous items and contaminated disposable material (culture dishes, gloves,

aprons and devices used to transfer, inoculate or mix, etc.) shall be handled and disposed of with special precautions. Biohazardous wastes with multiple hazards (radioactivity, toxicity, etc.) shall be segregated by the generator for individual evaluation.

- b. All biohazardous waste shall be contained from the point of origin to the point where it is no longer hazardous (disposal by incineration).
- c. The integrity of packaging is critical to ensure containment of waste during collection, storage and transportation. **All** sharps for disposal must be placed in approved sharps containers. **All** other nonradioactive, non-chemical biohazardous waste shall be in leak proof plastic bags of at least .6 mil thickness.
- d. Storage temperature and duration of storage are important considerations in the handling of biohazardous waste. It may be necessary for the generator of the waste to temporarily and securely store the waste until disposal arrangements have been made.

10. SUPERVISORY RESPONSIBILITIES

- a. It is the responsibility of each employee working with biohazardous agents to read and acknowledge understanding of this chapter. Refresher training, which includes the contents of this Chapter shall be conducted at least annually thereafter.
- b. The supervisor of any project that will result in the generation, use, handling, or storage of biohazardous agents is responsible for the following:
 - 1. Completing the Biohazard Registration and forwarding it to their Safety Official, prior to initiating a project. Projects already in progress shall be registered without delay. Receipt of completed registration forms will allow the Safety Office to review the project for potential biohazard, and aid in obtaining medical surveillance, etc.;
 - 2. Establishing a detailed, material-specific Standard Operating Procedure for all tasks or areas having the potential for exposure to biohazards, including spill, personnel exposure, decontamination and waste handling procedures and protective equipment required;
 - 3. Providing initial orientation and continuing education of all personnel on the biohazardous agents, proper work practices, and operation and maintenance of containment devices and personal protective equipment;
 - 4. Ensuring that affected employees are notified of the offer to participate in the medical; surveillance, screening and/or vaccination program; and
 - 5. Minimizing biohazardous waste generation and ensuring proper segregation/ packaging of waste for disposal.

APPENDIX A

COMMON CHEMICAL DECONTAMINANTS

<u>Type</u>	<u>Proprietary Examples</u>
Quaternary Ammonium Compounds	Micro-Quat, End-Bac, CDQ
Phenolic Compounds	Micro-Bac, Matar, Hil-Phene
Chlorine Compounds	Chlorox, Purex, Chloramine T
Formaldehyde	Sterac
Glutaraldehyde	Cidex
Alcohol, Ethyl	
Alcohol, Isopropyl	

Effective chemical disinfection is dependent on type of microorganism, degree of contamination, amount contaminated material present, contact time, temperature, pH, and type, concentration and quantity of decontaminant. Definitive data regarding the effectiveness of a particular decontaminant should be individually determined for test organisms and conditions, although a 30-minute minimum time is generally effective.

All chemical decontaminants are considered toxic, and may cause eye and skin irritation. Read the product label and take precautions appropriate to the hazard.

Items decontaminated with chlorine bleach should be neutralized with a 0.3 percent solution of sodium thiosulfate if they are to be steam sterilized (autoclaved) to prevent release of chlorine gas.

**APPENDIX B
MORBIDITY AND MORTALITY WEEKLY REPORT**

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- 377 Update: **Universal Precautions** for
Prevention of Transmission of Human
Immunodeficiency Virus, Hepatitis B
Virus, and Other Bloodborne Pathogens
in Health-Care Settings
388 Rocky Mountain Spotted Fever - United States, 1987
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Printed and distributed by the Massachusetts Medical Society publishers of The New England Journal of Medicine

WEEKLY REPORT

PERSPECTIVES IN DISEASE PREVENTION AND HEALTH PROMOTION

Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, or Other Bloodborne Pathogens in Health-Care Settings

Introduction

The purpose of this report is to clarify and supplement the CDC publication entitled "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (1).

In 1983, CDC published a document entitled "Guideline for Isolation Precautions in Hospitals" (2) that contained a section entitled "Blood and Body Fluid Precautions." The recommendations in this section called for blood and body fluid precautions when a patient was known or suspected to be infected with bloodborne pathogens. In August 1987, CDC published a document entitled "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (1). In contrast to the 1983 document, the 1987 document recommended that blood and body fluid precautions be consistently used for all patients regardless of their bloodborne infection status. This extension of blood and body fluid precautions to all patients is referred to as, "Universal Blood and Body Fluid Precautions" or "Universal Precautions." Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens.

The August 1987 publication should be consulted for general information and specific recommendations not addressed in this update.

Copies of this report and of the MMWR supplement entitled Recommendations for Prevention of HIV Transmission in Health Care Settings published in August 1987 are available through the National AIDS Information Clearinghouse, P.O. Box 6003, Rockville, MD 20850.

Update: HIV - Continued Universal precautions intended to prevent parenteral, mucous membrane, and nonintact skin exposures of health care Workers to bloodborne pathogens. In addition, immunization with HBV vaccine is recommended as important adjunct for health-care workers who are exposed to blood (3,4).

Since the recommendations for universal precautions were published in August 1987, CDC and the Food and Drug Administration (FDA) have received requests for clarification of the following issues: 1) body fluids to which universal precautions apply, 2) use of protective barriers, 3) use of gloves for phlebotomy, 4) selection of gloves for use while observing universal precautions, and 5) need for making changes in waste management programs as a result of adopting universal precautions.

Body Fluids to Which Universal Precautions Apply

Universal precautions apply to blood and to other body fluids containing visible blood. Occupational transmission of HIV and HBV to health-care workers by blood is documented (4,5). **Blood is the single most important source of HIV, HBV, and other bloodborne pathogens in the occupational setting. Infection control efforts for HIV, HBV, and other bloodborne pathogens must focus on preventing exposures to blood as well as on delivery of HBV immunization.**

Universal precautions also apply to semen and vaginal secretions. Although both of these fluids have been implicated in the sexual transmission of HIV and HBV, they have not been implicated in occupational transmission from patient to health-care worker. This observation is not unexpected, since exposure to semen in the usual health-care setting is limited, and the routine practice of wearing gloves for performing vaginal examinations protects health-care workers from exposure to potentially infectious vaginal secretions.

Universal precautions also apply to tissues and to the following fluids: cerebrospinal fluid (CSF), synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid. The risk of transmission of HIV and HBV from these fluids is unknown; epidemiologic studies in the health-care and community setting are currently inadequate to assess the potential risk to health-care workers from occupational exposures to them. However, HIV has been isolated from CSF, synovial, and amniotic fluid (6-8), and HBsAG has been detected in synovial fluid, amniotic fluid, and peritoneal fluid (9-11). One case of HIV transmission was reported after a percutaneous exposure bloody pleural fluid obtained by needle aspiration (12). Whereas aseptic procedures used to obtain these fluids for diagnostic or therapeutic purposes protect health-care workers from skin exposures, they cannot prevent penetrating injuries due to contaminated needles or other sharp instruments.

Body Fluids to Which Universal Precautions Do Not Apply

Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. The risk of transmission of HIV and HBV from these fluids and materials is extremely low or nonexistent. HIV has been isolated and Hbsag has been demonstrated in some of these fluids; however, epidemiologic studies in the health-care and community setting have not implicated these fluids or materials in the transmission of HIV and HBV infections (13,14). Some of the above fluids and excretions represent a potential source for nosocomial and community-acquired infections with other pathogens, and recommendations for preventing the transmission of nonbloodborne pathogens have been published (2).

Update: HIV - Continued

Precautions for Other Body Fluids in Special Settings

Human breast milk has been implicated in perinatal transmission of HIV, and Hbsag has been found in the HBV (10,13). However, Hbsag has been found in the milk of mothers infected with HBV (10,13). However, occupational exposure to human breast milk has not been implicated in the transmission of HIV or HBV infections to health-care workers. Moreover, the health-care worker will not have the same type of intensive exposure to breast milk as the nursing neonate. Whereas universal precautions do not apply to human breast milk, gloves may be worn by health-care workers in situations where exposures to breast milk may be frequent, for example, in breast milk banking. in HBV-DNA at Saliva of some

Saliva of some persons infected with HBV has been shown to contain HBV-DNA at concentrations 1/1,000 to 1/10,000 of that found in the infected person's serum (15). HBsAg-positive saliva has been shown to be infectious when injected into experimental animals and in human bite exposures (16-18). However, HBsAg-positive saliva has not been shown to be infectious when applied to oral mucous membranes in experimental primate studies (18) or through contamination of musical instruments or cardiopulmonary resuscitation dummies used by HBV carriers (19,20). Epidemiologic studies of nonsexual household contacts of HIV-infected patients, including several small series in which HIV transmission failed to occur after bites or after percutaneous inoculation or contamination of cuts and open wounds with saliva from HIV-infected patients, suggest that the potential for salivary transmission of HIV is remote (5,13,14,21,22). One case report from Germany has suggested the possibility of transmission of HIV in a household setting from an infected child to a sibling through a human bite (23). The bite did not break the skin or result in bleeding. Since the date of seroconversion to HIV was not known for either child in this case, evidence for the role of saliva in the transmission of virus is unclear (23). Another case report suggested the possibility of transmission of HIV from husband to wife by contact with saliva during kissing (24). However, follow-up studies did not confirm HIV infection in the wife (21).

Universal precautions do not apply to saliva. General infection control practices already in existence - including the use of gloves for digital examination of mucous membranes and endotracheal suctioning, and handwashing after exposure to saliva - should further minimize the minute risk, if any, for salivary transmission of HIV and HBV (1,25). Gloves need not be worn when feeding patients and when wiping saliva from skin.

Special precautions, however, are recommended for dentistry (1). Occupationally acquired infection with HBV in dental workers has been documented (4), and two possible cases of occupationally acquired HIV infection involving dentists have been reported (5,26). During dental procedures, contamination of saliva with blood is predictable, trauma to health-care workers' hands is common, and blood spattering may occur. Infection control precautions for dentistry minimize the potential for nonintact skin and mucous membrane contact of dental health-care workers to blood-contaminated saliva of patients. In addition, the use of gloves for oral examinations and treatment in the dental setting may also protect the patient's oral mucous membranes from exposures to blood, which may occur from breaks in the skin of dental workers' hands.

Use of Protective Barriers

Protective barriers reduce the risk of exposure of the health-care worker's skin or mucous membranes to potentially infective materials. For universal precautions, protective barriers

Update: HIV - Continued

reduce the risk of exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply. Examples of protective barriers include gloves, gowns, masks, and protective eye wear. Gloves should reduce the incidence of contamination of hands, but they cannot prevent penetrating injuries due to needles or other sharp instruments. Masks and protective eye wear or face shields should reduce the incidence of contamination of mucous membranes of the mouth, nose, and eyes.

Universal precautions are intended to supplement rather than replace recommendations for routine infection control, such as handwashing and using gloves to prevent gross microbial contamination of hands (27). Because specifying the types of barriers needed for every possible clinical situation is impractical, some judgment must be exercised.

The risk of nosocomial transmission of HIV, HBV, and other bloodborne pathogens can be minimized if health-care workers use the following general guidelines:

1. Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Do not recap used needles by hand; do not remove used needles from disposable syringes by hand; and do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture-resistant containers for disposal. *Locate the puncture-resistant containers as close to the use area as is practical.*

2. Use protective barriers to prevent exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply. The type of protective barrier(s) should be appropriate for the procedure being performed and the type of exposure anticipated.

3. Immediately and thoroughly wash hands and other skin surfaces that are contaminated with blood or other body fluids to which universal precautions apply.

Glove Use for Phlebotomy

Gloves should reduce the incidence of blood contamination of hands during phlebotomy (drawing blood samples), but they cannot prevent penetrating injuries caused by needles or other sharp instruments. The likelihood of hand contamination with blood containing HIV, HBV, or other bloodborne pathogens during phlebotomy depends on several factors: 1) the skill and technique of the health-care worker, 2) the frequency with which the health-care worker performs the procedure (other factors being equal, the cumulative risk of blood exposure is higher for a health-care worker who performs more procedures), 3) whether the procedure occurs in a routine or emergency situation (where blood contact may be more likely), and 4) the prevalence of infection with bloodborne pathogens in the patient population. The likelihood of infection after skin exposure to blood containing HIV or HBV will depend on the concentration of virus (viral concentration is much higher for hepatitis B than for HIV), the duration of contact, the presence of skin lesions on the hands of the

health-care worker, and - for HBV - the immune status of the health-care worker. Although not accurately quantified, the risk of HIV infection following intact skin contact with infective blood is certainly much less than the 0.5% risk following percutaneous

The August 1987 publication should be consulted for general information and specific recommendations not addressed in this update.

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needle stick exposures (5). In universal precautions, **all** blood is assumed to be potentially infective for bloodborne pathogens, but in certain settings (e.g., volunteer blood-donation centers) the prevalence of infection with some bloodborne pathogens (e.g., HIV, HBV) is known to be very low. Some institutions have relaxed recommendations for using gloves for phlebotomy procedures by skilled phlebotomists in settings where the prevalence of bloodborne pathogens is known to be very low.

Institutions that judge that routine gloving for all phlebotomies is not necessary should periodically reevaluate their policy. Gloves should always be available to health-care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

1. Use gloves for performing phlebotomy when the health-care worker has cuts, scratches, or other breaks in his/her skin.
2. Use gloves in situations where the health-care worker judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative patient.
3. Use gloves for performing finger and/or heel sticks on infants and children.
4. Use gloves when persons are receiving training in phlebotomy.

Selection of Gloves

The Center for Devices and Radiological Health, FDA, has responsibility for regulating the medical glove industry. Medical gloves include those marketed as sterile surgical or nonsterile examination gloves made of vinyl or latex. General purpose utility ("rubber") gloves are also used in the health-care setting, but they are not regulated by FDA since they are not promoted for medical use. There are no reported differences in barrier effectiveness between intact latex and intact vinyl used to manufacture gloves. Thus, the type of gloves selected should be appropriate for the task being performed.

The following general guidelines are recommended:

1. Use sterile gloves for procedures involving contact with normally sterile areas of body.
2. Use examination gloves for procedures involving contact with mucous membranes, unless otherwise indicated, and for other patient care or diagnostic procedures that do not require the use of sterile gloves.
3. Change gloves between patient contacts.
4. Do not wash or disinfect surgical or examination gloves for reuse. Washing with surfactants may cause "wicking," i.e., the enhanced penetration of liquids through undetected holes in the glove. Disinfecting agents may cause deterioration.
5. Use general purpose utility gloves (e.g., rubber household gloves) for housekeeping chores involving potential blood contact and for instrument cleaning and decontamination procedures. Utility gloves may be decontaminated and reused but should be discarded if they are peeling, cracked, or discolored, or if they have punctures, tears, or other evidence of deterioration.

Waste Management

Universal precautions are not intended to change waste management programs previously recommended by CDC for health-care settings

(1). Policies for defining, collecting, storing, decontaminating, and disposing of infective waste are generally determined by institutions in accordance with state and local regulations. Information

Update: HIV - Continued

regarding waste management regulations in health-care settings may be obtained from state or local health departments or agencies responsible for waste management.

Reported by: Center for Devices and Radiological Health, Food and Drug Administration. Hospital Infections Program, AIDS Program, and Hepatitis Br, Div of Viral Diseases, Center for Infectious Diseases, National Institute for Occupational Safety and Health, CDC.

Editorial Note: Implementation of universal precautions does not eliminate the need for other category- or disease-specific isolation precautions, such as enteric precautions for infectious diarrhea or isolation for pulmonary tuberculosis (1,2). In addition to universal precautions, detailed precautions have been developed for the following procedures and/or settings in which prolonged or intensive exposures to blood occur: invasive procedures, dentistry, autopsies or morticians' services, dialysis, and the clinical laboratory. These detailed precautions are found in the August 21, 1987, "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (1). In addition, specific precautions have been developed for research laboratories (28).

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**APPENDIX C
BIOHAZARDS REGISTRATION**

Supervisor's Name _____

Location _____

Extension _____

Principal Investigator's Name _____

Location _____

Extension _____

Biohazardous Agent _____ Specify

Human blood, blood products, _____

Human body fluids _____

Human Tissue _____

Human organs, body parts _____

Animals, animal carcasses _____

Virus _____

Bacterium _____

Fungi _____

Rickettsia _____

Other _____

Amount ___generated ___used ___handled ___stored per month:

Storage Site _____

Estimated amount for disposal per month _____

Summary of Project _____

Containment Devices Available _____

Investigator's assessment of biohazard

Low Risk _____

Moderate Risk _____

High Risk _____

Personnel involved in this project:

Other pertinent information _____

Form completed by (Signature) _____

Send completed form to: _____

CHAPTER 18

ISOLATION OF ENERGY SOURCES DURING THE SERVICING AND REPAIR OF MACHINES, EQUIPMENT AND PRESSURIZED SYSTEMS

01. POLICY AND DISCUSSION

The purpose of this chapter is to establish requirements and procedures to isolate machines, equipment, and pressurized systems from energy source(s) during servicing or repair by attaching locks or tags to energy isolation device(s). These procedures, which are commonly known as "Lockout/Tagout", are designed to prevent serious injury or death from unexpected start-up, energization, or sudden release of energy while equipment, machines, or pressurized systems are undergoing servicing or repair. Sources of energy can be electrical, steam, hydraulic, pneumatic, gravity, stretched or compressed springs, chemical and others. Some machines may use several types of energy sources.

Statistical studies conducted by the Occupational Safety and Health Administration (OSHA) revealed a high incidence rate of injuries and fatalities among persons who perform servicing and repair on mechanical equipment and pressurized systems. In response to this study OSHA promulgated a new safety standard to prevent these incidents under 29 CFR 1910.147. This chapter incorporates the requirements contained in this OSHA standard.

It is the policy of the Department of Commerce that all machines, equipment, and pressurized systems are to be isolated from their energy sources and locked or tagged out before any servicing or repair work is performed which the unexpected start-up or release of energy could cause injury or death. Lockout, rather than Tagout, is the preferred means of isolating equipment, machines or pressurized systems from their energy source(s), and shall be used whenever possible. Only authorized employees, as described in the definitions in this chapter, and have received required training, are permitted to perform Lockout/Tagout procedures. New machines, equipment and pressurized systems which may need to be locked out shall be equipped with a lockout device when purchased. Whenever existing equipment, machines or pressurized systems undergo major repairs, renovation or modification a lockout device shall be installed. Padlocks and tags shall be used only for locking or tagging out energy isolation devices, and shall be standardized throughout the facility by color, shape and size. Padlocks and tags shall be capable of withstanding the environment they will be exposed to (such as high or low temperatures, chemical vapors, steam etc.) for the maximum time that exposure is expected. Padlocks shall be substantial enough to prevent removal without the use of excessive force, such as with bolt cutters or other metal cutting tools. No two locks in the facility shall be keyed the same, and one key shall be maintained by the Authorized Employee and the other by the supervisor in a readily accessible location. Padlocks and tags shall be removed only by the person(s) who attached them, or by others under emergency situations after receiving authorization from the appropriate supervisor, in accordance with the provisions in section 2.b.(7) of the "Procedures and Requirements of the DOC Lockout/Tagout Program" provided at the end of this chapter. Padlocks shall have a warning affixed to them indicating the lock was attached to prevent serious injury or death and shall not be removed, and also the following information affixed to them: name, department, and phone number of person who attached it. Tagout devices shall have a similar warning printed on them, and also shall provide the name, department, supervisor and phone number of the person who attached it, and the date it was attached. Tagout devices shall be attached to the energy isolation device by a non-reusable, self-locking and non-releasable fastening device which has a minimum pull strength of 50 pounds. A nylon cable tie will meet this requirement.

02. SCOPE

The requirements of this chapter apply to all DOC employees and contractor personnel at all DOC facilities. Lockout/Tagout procedures shall be applied whenever an employee is required to remove a guard or other safety device, or required to place any part of his or her body in a danger zone of any equipment, machinery or pressurized system. Examples of the types of servicing or repair which require Lockout/Tagout procedures to be utilized include replacing drive belts on air handlers, adjusting chain drives, replacing motors, changing the blade on a saw, replacing gaskets on a pressurized system (steam, hydraulic, hot water, pneumatic, etc.), lubricating bearings in the proximity of moving parts, and other such operations.

This chapter does not apply to:

- a. Work on electrically powered equipment and machinery which is connected to its energy source by a cord and plug which does not exceed six feet, and which by unplugging will completely eliminate the possibility of unexpected energization or start-up of the equipment or machinery.
- b. Exposure to electrical hazards from work on or near electrical conductors or equipment associated with the commercial electrical distribution system, such as building electrical systems, switching stations, underground vaults etc. Lockout/Tagout procedures for electrical work are covered in Subpart S of the OSHA General Industry Standards, 29 CFR 1910.
- c. Minor tool changes, routine adjustments, and other minor servicing activities, as long as no guards or other safety devices are removed or bypassed, and there is no exposure to moving parts, electrical conductors, or other such hazards. Such examples are replacing the bit on a drill press, adjusting the tool rest on a grinder, installing a piece to be worked on in a lathe, replacing the cutter on a milling machine and other similar activities.

03. RESPONSIBILITIES

- a. Department Heads shall:
 1. Submit the names of all employees who service or repair to equipment, machines or pressurized systems which the unexpected start-up, energization, or release of energy could cause injury or death, to the Facilities Office or other appropriate department. Submit the names of all employees whose job requires them to operate or use equipment, machines or pressurized systems on which servicing or repairs is performed under lockout or tagout procedures, or whose job requires him or her to work in an area in which such servicing or repairs are performed. (Such persons are designated as "Authorized Employee" and "Affected Employee"; see definitions for further explanation.)
- b. Facilities Office shall:
 1. Maintain a roster of Authorized Employees and Affected Employees from names submitted by Department Heads. Maintain an inventory of special padlocks, tags and other devices to isolate energy sources. Issue these devices only to Authorized Employees. Padlocks shall be issued to each

individual, and only one key will be capable of opening each Authorized Employee's lock. The supervisor will be issued a duplicate key to be used only in the event of an emergency. Other devices to isolate energy sources include multi-lockout devices, chains, wedges, key blocks, wedges, and other devices to isolate, secure, or block energy sources.

2. Provide training to Authorized and Affected Employees to ensure they have a thorough understanding of the purpose and function of this program. Each Authorized Employee shall receive training in the recognition of hazardous energy sources present in the workplace, and the methods and means necessary for their effective isolation and control. Such training shall include the proper methods to apply Lockout/Tagout devices, and the use of other means of energy isolation and control, such as using chains or wedges to immobilize large fans, flywheels, pulleys and other such components which are subject to movement. Affected Employees shall be trained in the purpose and use of Lockout/Tagout procedures. Retraining shall be provided for all Authorized and Affected Employees whenever there is a change in their job assignments, a change in machines, equipment, or processes that present a new hazard, or when there is a change in Lockout/Tagout procedures. Additional retraining shall be provided whenever a "Review of Lockout/Tagout Requirements" (copy of this form provided at rear of this chapter) annual evaluation reveals inadequacies in the employee's knowledge or use of Lockout/Tagout procedures.

Initial training shall be provided at the time of assignment to duties involving work on equipment, machines, or pressurized systems. Refresher training shall be provided every three years for all Authorized and Affected Employees.

Training records shall include employee's names, the dates the training was provided, and a brief description of the topics covered. Copies of training records shall be maintained by the Facilities Office for five years.

3. Review completed "Review of Lockout/Tagout Requirements" forms (copy provided at end of this chapter) to ensure that all Authorized Employees have a thorough understanding of their responsibilities under this program and are capable of utilizing the Lockout/Tagout procedures properly. If such review identifies any Authorized Employee who does not meet these requirements he/she shall receive additional training. Such persons shall not be permitted to perform Lockout/Tagout procedures until a follow-up review is conducted and they demonstrate adequate competency.
4. Meet with representatives of contractors who will perform work at their facilities which requires the Lockout or Tagout of equipment, machines or pressurized equipment to review their procedures and provide them a copy of the DOC procedures.
5. Ensure that all new equipment, machines and pressurized systems procured or installed are equipped with energy isolating devices which are capable of being locked out.

6. Ensure that whenever major repairs, renovations or modifications of existing equipment, machines or pressurized systems are made, energy isolating device(s) which are capable of being locked out are installed.
 7. Develop written procedures for specific types of, or groups of, equipment, machines and pressurized systems within their facilities to control potentially hazardous energy during servicing or repairs. Such procedures shall describe actions necessary to isolate all sources of energy to prevent unexpected start-up, energization or release of energy during servicing or repairs. Provide copies of procedures to supervisors. Maintain copies of procedures for review by outside authorities.
- c. Supervisors shall:
1. Ensure that all employees under their supervision who utilize Lockout/Tagout procedures have received the required training and possess a thorough understanding of the procedures and possess the knowledge and skills required for the proper use of energy controls.
 2. Ensure that Lockout/Tagout procedures are utilized only by Authorized Employees, as defined in the definitions section of this chapter.
 3. Ensure that Lockout rather than Tagout is always used to isolate energy sources whenever possible.
 4. Ensure that Authorized Employees are provided with the proper energy isolation devices, including padlocks, multiple lockout devices, chains, wire ropes, wedges, flanges, tagout tags, and other such devices which are necessary to perform each particular job.
 5. Maintain a duplicate key for each padlock assigned to their personnel in a readily accessible location. Such keys will be used only in the event of an emergency, such as when the other key is lost, the Authorized Employee who attached it left it on overnight by mistake, or other such unusual circumstances. The padlock may be removed by others only after the supervisor has evaluated the circumstances and has determined that it is safe to do so in accordance with the provisions provided in section 2.b.(7) of the "Procedures and Requirements of DOC Lockout/Tagout Program" included in this chapter.
 6. Conduct an annual review with each of their Authorized Employees and complete the "Review of Lockout/Tagout Requirements" form provided at the end of this chapter. In conducting this review, supervisors are to determine whether the Authorized Employee has a thorough understanding of their responsibilities under this program, and is capable of properly utilizing the Lockout/Tagout procedures. If no operations requiring the utilization of Lockout/tagout procedures are scheduled, have each Authorized Employee simulate the application of the procedures on the type of equipment, machinery or pressurized system they would normally perform the procedures on, and record findings on the review form. Submit copies of the completed review forms to their Facilities Office, or other appropriate administrative office, for review and storage.

d. Employees shall:

1. Not perform any servicing, maintenance, repairs or other work on equipment, machines or pressurized systems where unexpected start-up or energization could cause personal injury or death unless they have been designated an Authorized Employee (as described in the definitions section) and have received the required training.
2. Comply with the Lockout/Tagout procedures and other applicable requirements of this chapter.

PROCEDURES AND REQUIREMENTS OF DOC LOCKOUT/TAGOUT PROGRAM

1. The following procedures are intended to be used to control potentially hazardous energy during the servicing or maintenance of machinery, equipment, steam, and hot water distribution systems, other pressurized systems, and other mechanical devices which have the potential to cause injury or death. Only employees who have been identified by their divisions as authorized employees and have received training are permitted to perform lockout/tagout procedures.

NOTE: If the machine or equipment is powered only by an electrical cord which is plugged into an outlet, and unplugging the cord will eliminate exposure to the hazards of unexpected energization or start-up, the requirements in these procedures do not have to be followed as long as the plug is disconnected from the outlet and remains in the immediate view of (not to exceed six feet), and control of the person performing the work.

2. All of the following procedures must be followed in the sequence in which they appear:
 - a. Preparation for lockout or tagout:
 - (1) Conduct a survey to locate and identify all isolating devices to be certain which switch(s), valve(s), or other isolating devices apply to the equipment to be locked or tagged out. Ensure that all energy sources, including electrical, steam, mechanical, hydraulic, chemical, gravity, pneumatic, compressed springs, and others have been identified.
 - (2) Notify all affected employees that a lockout or tagout procedure is going to be performed, and why. The authorized employee shall know the type and magnitude of energy that the machine or equipment uses and shall understand the hazards.
 - b. Isolating energy-control devices:
 - (1) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).
 - (2) Operate the switch, valve, or other energy-isolating device (s) so that the equipment is isolated from its energy source(s). Stored energy (such as in compressed springs; elevated machine members; rotating flywheels; pressurized steam; hot water; pneumatic; hydraulic; capacitors; chemical reaction vessels, etc.) must be dissipated or restrained by methods such as repositioning, blocking, opening valves, disconnecting pipes and misaligning and/or installing flanges; applying double block and bleed procedure; etc. Additional safety measures, such as removal of fuses or circuit breakers and opening of additional disconnecting or relief devices, shall be taken when necessary. Parts of machines or equipment which may move or rotate due to wind currents, positive or negative pressures which may develop inside duct work due to start-up of fans elsewhere in the system, or other reasons must be positively immobilized by using chains, blocks of wood, or other means to prevent movement during servicing. Examples of this are squirrel-cage type fans installed in duct fans on roofs, rams on hydraulic presses, shears, press brakes, steam, hot water, and other pressurized systems.

- (3) Attach an individually assigned padlock(s) to the energy-isolating device(s) if it is capable of being locked with a padlock. If the energy-isolating device(s) is not capable of being locked out, a commercially available equipment tagout tag shall be attached to the energy-isolation device(s) at the same location(s) at which the padlock(s) would have been attached. If the tagout tag(s) cannot be attached directly to the energy isolation device(s), it shall be located as closely as is safely possible to the device(s), in a position that will be immediately obvious to anyone attempting to operate the device.
- (4) Remove all personnel from the area, and after ensuring that all are clear, operate the push button, or other normal operating controls, to make certain that the equipment will not operate, and is positively isolated from all energy sources. If the equipment will not operate, return the controls to the neutral or off position after the test.

After the preceding steps, if more than one individual is required to lockout or tagout equipment, each shall place his/her own personal padlock or Equipment Tagout Tag on the energy-isolation device(s). If the energy-isolation device cannot accept multiple locks or tagout tags, a multiple lockout or tagout device (hasp) may be used. Primary responsibility for the group of employees whose locks or tagout tags are attached to the multiple lockout/tagout device shall be assigned to an authorized employee who shall monitor the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment. When more than one crew, trade, department, etc. is involved, overall job-associated lockout or tagout control responsibility shall be assigned to an authorized employee who shall be designated to coordinate affected work forces and ensure continuity and protection.

- (5) Temporary removal of lockout or tagout devices to test or reposition machine components require the following actions in the sequence in which they appear:
 - (a) Clear the machine, equipment or system of tools, materials, and other such items.
 - (b) Clear the surrounding area of nonessential tools, materials, and check the machine, equipment or system being worked on to ensure that all components are operationally intact.
 - (c) Remove all employees from the area who are not required for testing.
 - (d) Verify that all affected employees are in a safe location.
 - (e) Remove the lockout or tagout devices.
 - (f) Energize and proceed with the testing or positioning.
 - (g) After the testing or positioning is complete, reapply energy control measures and lockout/tagout devices to continue the servicing or maintenance.

- (6) Transfer of lockout/tagout devices during changes of personnel working on machines or equipment shall be done using the following procedures:
 - (a) The off-going authorized employee shall inform the incoming authorized employee of all locations where lockout and tagout devices are applied.
 - (b) The off-going authorized employee shall remove their lockout/tagout devices in the presence of the incoming authorized employee, and the incoming authorized employee shall apply his/her lockout or tagout devices at the same location(s) at the same time.
- (7) Emergency removal of lockout/tagout devices shall be removed from energy isolating devices by the authorized employee who applied the device. When the employee who applied the lockout or tagout device is not available to remove it, that device may be removed by utilizing the following procedures:
 - (a) Make a reasonable effort to contact the authorized employee to verify that he/she is not at work.
 - (b) If the authorized employee who applied the lockout or tagout device is not at work or cannot be located, obtain the duplicate key to the padlock from the supervisor.
 - (c) Thoroughly check the machine, equipment or system, and the surrounding area to locate the authorized employee prior to removing lockout or tagout device. If the authorized employee cannot be found to remove the lockout or tagout device.
 - (d) Notify the authorized employee upon his/her return to work that his/her lockout or tagout device was removed before permitting them to return to work on the machine, equipment or system.
- 3. Restoring machines or equipment to normal operations following lockout or tagout shall be preformed by the authorized employee(s) using the following procedures:
 - 1. The work area shall be checked to ensure that all tools, materials, and other nonessential items have been removed from the machine, equipment, or system being worked on and the surrounding area.
 - 2. Thoroughly check the machine, equipment, or system to ensure that all are components operationally intact.
 - 3. Remove all employees to a safe location.
 - 4. Notify all affected employees that lockout/tagout devices are being removed.
 - 5. Remove lockout/tagout devices and operate the machine, equipment or system, and check to ensure it is operating properly.

REVIEW OF LOCKOUT/TAGOUT REQUIREMENTS

EMPLOYEE REVIEWED	REVIEW DATE	DEPARTMENT	TELEPHONE
CONDUCTED BY		DEPARTMENT	TELEPHONE

LOCKOUT/TAGOUT PROCEDURE REVIEW

DESCRIPTION OF MACHINE OR EQUIPMENT USED IN THIS REVIEW

EQUIPMENT DESCRIPTION	SERIAL NO.	LOCATION
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TYPE OF PROCEDURE USED: (If energy isolation device can be padlocked, the Lockout procedure must be used rather than Tagout)

- ☐ LOCKOUT
☐ TAGOUT

PROCEDURE CHECKLIST	SAT	UNSAT
Conduct survey to locate and identify all isolating devices.		
Notify affected persons that a Lockout or Tagout procedure is to be preformed.		
Shut down machine or equipment by normal stopping means (push the stop button, etc.).		
Place its energy isolation device (switch, valve, etc.) so that it is isolated from its energy source.		
Attach padlock to energy isolation device if it is capable of being locked with a padlock; otherwise attach a special equipment Tagout tag (NDW-NRL 5101/1203).		
Take other actions as necessary to prevent movement of parts, such as placing chains on fan blades, placing block under ram of hydraulic press, removing springs, etc.		
Remove all personnel from the area and then operate controls to ensure that adequate energy isolation has been achieved and the equipment will not operate.		
After maintenance or servicing is complete, and the equipment is ready for normal operations, remove all personnel, tools, etc., from area.		
Reinstall all guards and other safety devices which were removed.		
Remove all Lockout and Tagout devices and operate the equipment.		

LOCKOUT/TAGOUT RESPONSIBILITIES REVIEW	SAT	UNSAT
Maintenance, servicing, or repair on machines or equipment where the unexpected start-up or energization of the equipment could cause personal injury or death shall not be performed unless Lockout/Tagout procedures have been applied.		
Always use Lockout instead of Tagout wherever possible.		
Never remove another person's lock or tag without supervisor's authorization.		
Never borrow or lend locks or keys.		

Based on the above findings, I feel this employee:

- ☐ Utilized Lockout/Tagout procedures properly and is adequately familiar with his/her responsibilities under the DOC Lockout/Tagout Program.
☐ Needs additional training in the following areas:

SIGNATURE	NAME (Printed or Typed)	DATE
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