Safety and Health for Field Operations

NPS Handbook

Addendum to RM 50B National Park Service "Occupational Safety' and Health Program"

INTRODUCTION

This Handbook lays the groundwork for incorporating occupational safety and health into the planning of all NPS work projects and tasks. This Handbook will assist supervisors in providing a safe and healthful workplace for NPS employees and volunteers. It will provide employees with information on safe work practices, identification of hazards, and reporting of unsafe working conditions.

This Handbook is a tool that supports the supervisor's and manager's responsibility to promote positive safety and health attitudes among employees, and integrates safe procedures standards into all NPS activities. Supervisors are responsible for recognizing and rewarding employees for outstanding performance in the area of occupational safety and health.

Every NPS supervisor, employee, and volunteer is responsible for following safe work practices and procedures, and identifying and reporting unsafe conditions. The purpose of this Handbook is to provide assistance in carrying out those responsibilities.

TOPICS

TOPIC 19 — OFF-ROAD VEHICLES

TOPIC 20 — CONSTRUCTION AND MAINTENANCE

TOPIC 21 — GROUNDS MAINTENANCE

APPENDIX — FACILITIES SAFETY INSPECTION CHECK LIST

TOPIC 1

JOB HAZARD ANALYSIS

1.1 **References**

A. 485 DM Safety & Health Handbook Chapter 14

B. NPS Reference Manual 50B, Section 13

1.2 **Procedures.** Job Hazard Analysis (JHA) procedures include identification of tasks, potential hazards, and safe job practices/procedures. Employees and supervisors should work together in the development of the JHA to assure that all characteristics of the job are addressed and that the safest and most efficient means of performing a job will be utilized. A JHA is required to be completed for:

A. Jobs or work practices that have potential hazards

B. New, nonroutine, or hazardous tasks to be performed where potential hazards exist

C. Jobs that may require employee use of out-of-the-ordinary personal protective equipment (PPE)

D. Changes in equipment, work environment, conditions, practices, policies, or materials

1.3 **Responsibility.** Supervisors shall discuss the job hazards with employees prior to beginning new projects or upon changing work sites, identify any hazards not noted on the JHA, and discuss ways to reduce these hazards, including the use of protective equipment. Supervisors and appropriate line managers shall ensure that established JHAs are reviewed and signed prior to any nonroutine task, or at the beginning of the field season or fire season.

A. **Conducting a Job Hazard Analysis.** In order to develop a JHA, the job to be evaluated is broken down into basic steps by the supervisor and the employee assigned to perform the job. They identify hazards and safe job procedures. The Job Hazard Analysis Form is used for the preparation of JHAs (see Illustration 1-1).

Illustration 1-1

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
JOB HAZARD ANALYSIS

Date

☐ New ☐ Revised

District/Work Group

Supervisor

Page of

Reviewed by: *(Safety Manager)*

Qualifications, training, and experience required

Personal Protective Equipment required/recommended

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES

(Instructions on reverse)

Form 1112-3 (March 1993)

INSTRUCTIONS FOR COMPLETING JOB HAZARD ANALYSIS

Job Hazard Analysis (JHA) is an important accident prevention tool that works by identifying hazards and minimizing or eliminating them before the job is performed. Use your JHA for hazard awareness and job clarification, as orientation for new employees, for refresher training of experienced employees, as a reminder for infrequent or nonroutine jobs. JHA may be used as an accident investigation tool, and for informing all employees of specific hazards and protective procedures and equipment.

You may want to set priorities for completing JHA's: jobs with high hazard potential, jobs that have a high accident/injury rate, and new jobs with no accident or injury history.

BASIC JOB STEPS

Break the job down into steps. Each of the job steps should accomplish a major task. The task may consist of a set of movements. For example, loading a pickup truck with materials from the warehouse into a pickup. Let's break that down into job steps. Picking up the materials and placing them on a handtruck is one set of movements, the job step. Everything related to that one set of movements is part of that job step.

The next set of movements might be pushing the loaded handtruck to the loading dock or to the pickup. Removing the materials from the truck and placing them in the pickup bed is another set of movements. Finally, returning the handtruck to the warehouse area might be the final step in this job.

List all the steps in a job. Some steps may not be done each time—checking the center on the handtruck, for example. However, that task of the job should be listed and analyzed.

POTENTIAL HAZARDS

Examine each step to find and identify hazards—actions, conditions, or possibilities that could lead to an accident.

It's important to look beyond the obvious hazards, to look at the entire environment and discover every hazard that might exist.

Be sure to list health hazards as well, even though harmful effect may not be immediate. An example might be the harmful effect of inhaling a specific chemical over a long period of time.

It's important to identify all hazards. Hazards contribute to accidents, injuries, and occupational illnesses and diseases.

In order to do part three of a JHA effectively, you must identify and distinguish between hazards, accidents, and injuries. Each of these terms has a specific meaning:

HAZARD—a potential danger. Oil on the floor is a hazard.

ACCIDENT—an unintended occurrence that may result in injury, loss, or damage. Slipping on the oil is an accident.

INJURY—the result of an accident. A sprained wrist from the fall would be an injury.

Sometimes it is easier to identify possible accidents and illnesses and work back from them to the hazards. Just be sure to include the hazard, accident, injury, and recommended actions and safe work procedures.

SAFE JOB PROCEDURES

Using the first two columns as a guide, decide what actions should be taken to eliminate or control the hazards that could lead to an accident, injury, or occupational illness or disease.

Actions that can be taken are: (1) engineering the hazard out, (2) changing work practices or procedures, (3) training, (4) good housekeeping, (5) providing personal protective equipment, (6) adjusting work elements or (positioning the person in relation to equipment, materials, or other elements in the environment in such a way as to eliminate stresses and strain).

List recommended safe job procedures in column three, and remember to list required or recommended personal protective equipment for each step of the job.

BE SPECIFIC. Say exactly what needs to be done to eliminate the hazard and avoid the accident. Avoid general statements such as "be careful" use "caution" or "work safely."

Give a recommended safe job procedure for every hazard.

If a serious hazard is identified, it should be corrected immediately.

Your JHA should be revised to reflect changes in equipment, environment, policy, materials, or in work conditions.

1. **Identification of Tasks.** Each step of a job should identify a major task and briefly describe each in the order in which it is performed. Three or four words may be sufficient to describe each job step. Avoid steps that are too detailed. They will make the JHA unnecessarily long and trivial. For example, sanding and painting a picnic table are major tasks to be listed; opening a paint can is not considered a major task and would not be included on the JHA. Most jobs can be separated into 12 to 15 basic steps.

2. **Potential Hazards.** Each step is examined to identify potential hazards. Hazards may be associated with work practices, procedures, equipment, materials, or environment. Questions to be considered to help identify specific hazards include: Could the worker come in contact with; be struck by; strike against; be caught in, under, between; slip, trip, or fall; or suffer from overexertion?

3. **Safe Job Procedures.** Safe job procedures to reduce or abate the hazards are identified. The use of general terms such as "be careful", "use caution", or "work safely" should be avoided. Safe job procedures will normally fall into one of the categories listed below:
   a. Environmental change

   b. Reduction in the frequency task is performed

   c. Personal protective equipment changes

   d. Job procedures/work practices

   e. Safe behaviors

B. **Job Hazard Analysis Review.**

C. **Job Hazard Analysis Reevaluation.** Established JHAs should be reevaluated periodically, at least every three years, to ensure that they reflect the latest, safest, and most efficient way to perform the task. New equipment, tools, methods, and changes in safety standards should require modifications in JHAs.

D. **Job Hazard Analysis Recordkeeping.** Supervisors are responsible for maintaining JHA records.

TOPIC 2
TRAINING

2.1 References

A. 29 CFR 1960 Subpart H

B. 29 CFR 1910, OSHA Standards for General Industry

C. 29 CFR 1926, OSHA Standards for Construction

D. DM 485, Chapter 13

E. NPS Reference Manual 50B, Section 9

2.2 **Procedures.** Supervisors are responsible for establishing when, where, and how to do each job safely. They are to ensure the proper use and care of personal protective equipment (PPE) and NPS property. Supervisors shall ensure that their employees receive the training necessary to safely perform job tasks. The supervisor may obtain assistance for developing and conducting safety training from qualified and experienced employees, park safety contacts and managers, Regional safety personnel, private industry, OSHA, EDA, etc. However, it is the supervisor's responsibility to ensure the quality and timeliness of the safety training.

A. **General Training.** It is imperative that all Bureau employees be provided safety training prior to assignment and throughout the course of their employment.

B. **Mandatory Training Requirements.** There are numerous jobs throughout the Bureau that require training and/or certification prior to perform forming certain tasks. Supervisors are advised to check with appropriate safety personnel if an area is not covered. Mandatory training must be documented.

C. **General Safety Training Requirements.** The following table summarizes mandatory and general operations safety training requirements based upon tasks assigned and do not apply to everyone.

Consult with the specific standard reference for complete training and frequency requirements.

Position/Task	Authority
Safety Training for Managers	29 CFR 1960.54
Safety Training for Supervisors	29 CFR 1960.55
Safety Training for Collateral Duty Safety Officers	29 CFR 1960.58
Safety Training for Safety Specialists	29 CFR 1960.56
Safety Committee Training	29 CFR 1960.58

Regulatory Safety Programs (OSHA, EPA, NFPA)	Authority
Air Contaminates	29 CFR 1910.1000
Asbestos	29 CFR 1910.1001 & 29 CFR 1926.1101
Blasting and Explosives Use	29 CFR 1926.900-914 & DO # 65
Bloodborne Pathogens Exposure Control	29 CFR 1910.1030
Confined Space Entry	29 CFR 1910.146
Crane and Derrick Operations	29 CFR 1910.179-181
Diving Safety	29 CFR 1910.401-441 & DO # 4
Electric Power Generation, Transmission and Distribution	29 CFR 1910.269
Electrical Safety (High Voltage, etc)	29 CFR 1910.301-399 & NFPA 70E
Emergency Action Planning	29 CFR 1910.38
Excavation and Trenching Safety	29 CFR 1926.650-652
Fall Protection	29 CFR 1926.500-503
Fire Prevention and Protection	29 CFR 1910.155-165 & NFPA 101
Flammable and Combustible Liquids Use and Storage	29 CFR 1910.106 Hazard
Communication Program	29 CFR 1910.1200
Hearing Conservation	29 CFR 1910.95
Hazardous Waste Operations and Emergence Response	29 CFR 1910.120
Laboratory Safety Program	29 CFR 1910.1450

Lead	29 CFR 1910.1025 & 29 CFR 1926.62
Lockout/Tag-out	29 CFR 1910.147
Logging Operations	29 CFR 1910.266
Machine and Machine Guarding	29 CFR 1910.211-219
Medical Services and First Aid	29 CFR 1910.151
Personal Protective Equipment	29 CFR 1910.132, 133, 135-140
Powered Industrial Trucks (Forklift)	29 CFR 1910.178
Process Safety Management	29 CFR 1910.119
Radiation Safety (Ionizing/Non-Ionizing)	29 CFR 1910.97 & .1096
Respiratory Protection Program	29 CFR 1910.134
Scaffolding Safety	29 CFR 1926.450-.454
Servicing of Multi Piece & Single Piece Rims	29 CFR 1910.177
Sign and Tag Recognition	29 CFR 1910.145
Storage and Handling of LP Gases	29 CFR 1910.110 & NFPA 58
Telecommunications Safety	29 CFR 1910.268
Welding, Cutting, Brazing Safety	29 CFR 1910.251-255

2.3 **GENERAL OPERATIONS PROGRAMS (DOI, NPS, Consensus Standards)** The following table is a supplemental list of NPS Programs that may include safety/training requirements:

Avalanche Control Operations	**Park Specific Program**
Aviation Safety	http://www.oas.gov; **DO # 60 A**
Backcountry Operations	**Park Specific Program**
Boat/Vessel Operation	**36 CFR Part 3; DM 485, Chapter 22**
Dam Safety Program	**(2001) NPS Management Policy 9. 5, Dams and Reservoirs**

Disaster Preparedness Plan	**Park Specific Plan**
Motor Vehicle Operations	**RM # 50 B, Section15**
Fee Collection Operations	**DO # 22**
Hantavirus	**http:*//www.nps.gov/ pub lic_health***
Integrated Pest Control Management	**DO # 77-7**
Law Enforcement Procedures	**DO # 9**
Lyme Disease	**RM # 50 B, Appendix A**
Medical Standards	**DO #57**
Motor Vehicle Operations	**RM # 50 B, Section 15**
Museum and Artifact Preservation Operations	**DO # 24**
Search and Rescue Operations	**(2001) NPS Management Policy 8. 2. 5. 3, Search and Rescue**
Snow Plowing and Removal Operations	**Park Specific Program**
Volunteer Safety Program	**DO #7**
Wellness Program	**DO #57**
Wildland Fire Operations	**DO #18**
Workplace Violence Prevention Program	**http:*//www.opm.gov/ehs/ workplac/index.htm***
Youth/SCA Program	**DO # 26**

TOPIC 3

FIELD WORK

3.1 **References**

A. 29 CFR 1910.142 Temporary Labor Camps

3.2 **Procedures.** Bureau activities sometimes require employees to travel and work alone in remote and hazardous areas. At least two employees should be assigned to work in such areas, and always with dependable, established communications. Assessing field hazards is a continual process. The Job Hazard Analysis (JHA) process will assist both supervisors and employees in minimizing or eliminating those hazards. Safety orientation is mandatory for employees involved in field activities.

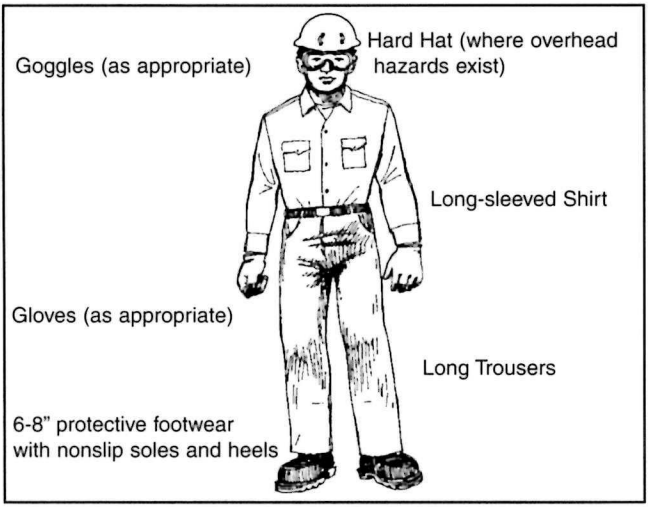
A. **Check-Out/Check-In System.** The Bureau's check-out/check-in system requires maintaining a written record containing the itinerary, name of employee, work area, estimated time of return, and miscellaneous information such as names of other crew members, etc. In the event an employee does not return or contact the office at the designated times, search and rescue procedures shall be initiated. All field camps must have established communications to request assistance.

3.3 **Field Attire.** Safe field attire will be determined by management, JHA, or as required by specific activity. For general working conditions, the recommended attire is the following: 6- to 8-inch protective footwear with nonslip soles and heels, long trousers, and long-sleeved shirt (see Illustration 3-1).

3.4 **Foot Travel.** Always notify other workers of intended route and destination, and work close enough to them to permit a quick response to a call for assistance.

A. **Avoid** travel, resting, or camping in snag or high windfall areas when windy weather or lightning may endanger life and property.

Illustration 3-1



B. **Avoid using** rotten or loose-barked logs as foot logs over creeks or gullies. Have secure footing at all times. Rocky slopes, especially slide rock and steep country, can be treacherous. Have one hand free to protect against falls or obstructions. Carry hand tools on lower side when walking along contours or slopes.

C. **Always be on guard against** injury from falling trees, snags, limbs, rolling logs, or rocks. Don't run blindly from a falling rock, log, or tree. Determine its falling direction, get out of its path, and alert others.

D. **Guard against** twigs or branches striking face and protect co-workers from similar whiplashes.

E. **When possible, detour around hazardous areas** such as rock slides, lava flows, rim rock, sand dunes, steep or undercut river banks, quicksand, dense brush, deep gullies, canyons, bear dens, hornet nests, poison ivy or poison oak, etc.

3.5 **Vehicle Travel.** In case of a disabled or stuck vehicle, remain with the vehicle. The vehicle can be more easily seen from the air than a person can alone, and it also provides shelter from the sun or the cold. If lost and without radio contact, sweep the horizon during the daytime with the light beam of a signal mirror. This beam is visible over a great distance and might be seen by someone. Flash vehicle headlights (three rapid flashes) at night, especially if aircraft can be heard.

3.6 **Winter Travel.** Prior to winter travel, follow office check-out/check-in procedures for personnel and winter-survival equipment. To minimize the hazards associated with winter driving, both the vehicle and the driver must be prepared in advance. Always drive at a speed that matches visibility, traffic, and road conditions.

A. To see and be seen by others requires the driver to clean all snow and ice from the **entire** vehicle — hood, roof, trunk, lights, and windows. Snow left on any of these areas increases the possibility that visibility will be affected when the vehicle is in motion.

B. Follow manufacturers' recommendations when equipping vehicles with studded tires or chains.

C. Snow tires are recommended, but chains provide the best starting and stopping performance in severe snow and on icy surfaces. Radial tires are not snow tires unless they have a snowtread configuration and are marked "M&S" for "mud and snow."

D. If your vehicle breaks down and you are stranded, it is best to stay with your vehicle. You should only run your heat for 10 minutes every hour or so to conserve fuel. Make sure the exhaust pipe is clear of snow. Open a window every once in a while to let in fresh air.

3.7 **Desert and Arid Areas.** Never go into the desert with out first informing someone of your destination, your route, and when you will return (check-out/check-in). Stick to your plan.

A. Carry at least 1 gallon of water per person per day of your trip. Plastic jugs are handy and portable.

B. Be sure your vehicle is in good condition.

C. Keep an eye on the sky. Flash floods may occur any time you are downslope from "thunder heads," even though it may not rain where you are.

D. If your vehicle breaks down, stay near it. Your emergency supplies are with the vehicle. (See 4.3 C and E)

E. If water is limited, keep your mouth shut and breathe through your nose to reduce water loss and drying of mucous membranes. **DO NOT** talk, eat, smoke, drink alcohol, or take salt.

F. **DO NOT** sit or lie directly on the ground. It may be 30 degrees or more hotter than the air.

G. Although nights can be very cold, necessitating proper attire, clothing for the desert should be lightweight, light colored, and cover the whole body. Have appropriate eyewear to protect eyes from sun glare.

3.8 **Remote Camp Safety and Sanitation.** All sites used for camps must be adequately drained. They shall not be subject to periodic flooding, nor located within 200 feet of swamps, pools, sinkholes, or other surface collections of water, unless mosquitoes can be controlled on such still-water surfaces. The camp must be located so the drainage from and through the camp will not endanger any domestic or public water supply.

All sites must be graded, ditched, and rendered free from depressions in which water may become a nuisance. All sites must be adequate in size to prevent over crowding of necessary structures. The principal camp area where food is prepared and served and where sleeping quarters are located must be at least 500 feet from any area in which livestock are kept.

A. **References**
(1. 29 CFR 1910.141-142.)

B. **Gray Water.** Gray water disposal pits shall be constructed to permit leaching within 24 hours. If leaching does not occur because of water table, a series of shallow small canals shall be constructed for evaporation and leaching. Gray water disposal area will be located at least 50 feet down gradient from water source.

C. **Potable Water.** Transported potable water must be obtained from a treated source, or chlorinated, if obtained from a nontreated source, and kept pure and free from contamination through proper handling and storage procedures. Request the advice of local health departments, prior to the use of any surface water such as lakes, springs, rivers, and streams. Canteens, if not in use, must be emptied, disinfected, and dried.

D. **Toilet Facilities.** Approved toilet facilities adequate for the capacity of the camp must be provided and must be located 200 feet or more from any water source. A description of toilet facilities requirements is stated in 29 CFR 1910.142(d).

E. **Kitchen Tents.** Keep kitchen tents clean and tidy and keep foodstuffs away from cleaning supplies. Two fire extinguishers should be present and ready.

1. Store foodstuffs in rodent and pest-proof containers.

2. Make sure pots and pans are clean and inverted for dust and germ control. Silverware should be clean and covered.

3. Freezer temperature should be set at zero or below; refrigerators should be set at 45 degrees.

F. **Propane Tanks and Generators.** Propane tanks will be properly anchored. Generators should be placed downwind with plywood noise control. Electrical panel boxes are to be protected from the weather. Propane tank and other fuel storage containers should be at least 50 feet away from camp and properly posted with "No Smoking" signs.

3.9 **Camp Aviation Procedures.** When established, a camp fueling site must have the proper fuel containment. Both fuel bladders and barreled fuel must be kept in secondary containment (diked) in case of a fuel spill. The daily fuel log must be kept current. "No Smoking" signs must be posted and visible at any approach to the site. (No smoking is allowed within 50 feet of fueling site). Fuel source must be grounded and bonded through machinery (filters, pumps, etc.) and then to aircraft. The site must be located a minimum of 100 feet from personnel quarters and must be kept tidy with no loose articles allowed in area that might be blown into helicopter rotors or aircraft propellers.

A. A windsock shall be installed in accordance with OAS Heliport Specifications.

B. The fuel tank pump will be equipped with a remote switch.

3.10 **Lightning Storms.** Lightning seeks the easiest route (not necessarily the shortest) between positive and negative regions within a cloud or between positive

charges on the ground and negative charges in the cloud. The human body offers a path of least resistance. The hazard of lightning occurs in two ways, either as a direct hit or as a ground current.

A. **General Guidelines During Lightning Storms**

1. Seek shelter inside a building.

2. Select fiberglass or plastic hard hats rather than those of metal construction.

3. Don't work on fences, electrical lines, pipelines, or structural steel fabrication.

4. Don't use metal objects like fishing rods, soil augers, well-logging equipment, etc., that are in contact with the ground.

5. Automobiles provide a safe shelter because the metal body creates a pathway for the lightning around your body. Avoid contact with metal objects in the car where your body could become a pathway.

6. Lightning tends to strike the highest electrically conductive object in the area-peaks, ridges, towers, trees, isolated sheds (especially with metal roof or siding), wire fences, etc. Seek lower elevation, as in valleys or canyons.

7. Avoid streams and lakes. If in a low area, be cautious of flash floods and sloughing off of earthen or rock materials from above.

8. Sit on some insulating material if possible, such as coiled rope, a wooden pack board, a folded sleeping bag, a wool shirt, etc.

9. A crouched position—sitting on your feet with the knees drawn up and feet close together—seems best to minimize the distance spanned by your contact points. Avoid any position with a hand, shoulder, or head touching a surface.

3.11 **Potentially Violent Personal Encounters.** Employees may encounter opportunistic individuals, persons under the influence of drugs and/or alcohol, and extremist groups. Employees may encounter visitors who are stressed, tired, and pushed beyond their normal ability to deal rationally and courteously. Parks must be responsible by providing training to employees regarding risk assessment, threat assessment, aware ness and communication skills for conflict situations.

Employees should be made aware of potential criminal activity in areas (e.g., drug labs, marijuana cultivation, poaching, gang activity, etc.) and be provided with professional responses, should these activities be encountered.

Parks must be responsible for facility assessments (meaning all structures, trails, parking lots, campgrounds, etc.) that target places opportunists could gain an advantage over employees.

Parks should provide information for safe personal travel and safe behavior to employees visiting their area for training or details.

A training module is available on this subject. It is Training Module #111, "Personal Safety and Security," available through Mather Training Center, Harpers Ferry, WV.

An additional Resource is the U.S. Forest Service video, titled "Violence in the Workplace, Module #1."

STOP, THINK, OBSERVE, PLAN

Practice mental and physical preparedness techniques every day.

Be aware.

Ask questions of supervisors, maintenance, law enforcement and safety personnel.

Be sure your batteries are charged and your radio/cell phones work.

Know your escape routes.

Have a safe harbor.

Do not conduct an activity if you feel it is unsafe.

TOPIC 4

MOTOR VEHICLE AND EQUIPMENT SAFETY

4.1 **References**

A. 370 DM Appendix A

B. 485 DM Chapter 16

C. 5 CFR 930 Subpart A Motor Vehicle Operators

D. 49 CFR 383-395 Commercial Drivers License (CDL)

E. 29 CFR 1926.601 Motor Vehicles

F. NPS Reference Manual 50B, Section 15

4.2 **Procedures.** (See NPS RM 50B, Section 15.)

4.3 **Equipment.** Government-owned or Government-leased vehicles will be maintained in good mechanical condition.

A. **Defective Vehicle.** Vehicle defects identified by the operator or during safety inspections shall be immediately reported to the supervisor and fleet manager. Defective vehicles shall be removed from service until repaired.

B. **Disabled Vehicle.** The operator may make only authorized emergency repairs to a government vehicle. The operator shall have it towed, if necessary. (Refer to the vehicle book).

C. **Vehicle Inspections.** Monthly vehicle inspections shall be performed and documented by the vehicle operator or designated person. The inspection shall include checking vehicle lights (brake, tail, backup), mirrors, wipers, washers, defroster, gauges, brakes, fluids, and belts. Operators will ensure emergency equipment (first-aid kit, reflectors, jack/lug wrench) is in the vehicle.

D. **Seat Belts.** Seat belts must be available and used in Bureau motor vehicles. (Reference Executive Order 13043, April 16, 1997)

1. Without exception, seat belts must be worn at all times by motor vehicle operators and passengers, regardless of the distance to be traveled or the time involved. If any employee fails to fasten his/her seat belt while riding in a vehicle on official business, he/ she is subject to disciplinary action as determined by local management. (Reference 370 DM Appendix A)

2. All heavy, self-propelled equipment fitted with rollover protective structures must have a seat belt for the operator. Seat belt use by the operator is mandatory.

E. **Safety/Survival Equipment.** Every field vehicle shall be equipped with warning flags or reflectors, a tool kit, and a first-aid kit. Additional emergency equipment may be carried in each vehicle as determined by local need.

F. **Fire Extinguishers.** Approved fire extinguishers are required in buses, ambulances, fire engines, fire trucks, heavy motorized mobile equipment, special use vehicles, and as required by Department of Transportation (e.g., hauling of hazardous materials, such as gasoline, explosives, chemicals, etc.). (49 CFR 393.95) All government-owned or –leased vehicles shall be equipped with fire extinguishers that are properly maintained and inspected.

G. **Accident Reporting Kit.** All Bureau-owned or -operated motor vehicles, including off-road vehicles and special-use equipment, will carry a packet containing all accident report forms and other information needed by the driver in case of an accident or other emergency. These packets will be

General Services Administration (GSA) Motor Vehicle Accident Reporting Kits. Accidents will be reported using the DOI Safety Management Information System (SMIS).

4.4 **Vehicle Servicing and Repairs.** Maintain and operate vehicles as recommended by the manufacturer. Comply with GSA requirements on use, care, maintenance, and inspections contained in the loose-leaf vehicle book in each vehicle. In case of accident, be familiar with "WHAT TO DO IN CASE OF ACCIDENT" material. Additionally all drivers should:

A. Maintain records of all repairs and inspections.

B. Replace tire when the tread depth of any tire on the front steering wheels of any vehicle exceeding 10,000 GVWR falls below 4/32 inch.

C. Keep interior and exterior of vehicle clean at all times and free of trash and loose items.

D. Have maintenance done by a qualified mechanic. Always check items repaired before driving vehicle away from repair shop.

E. Comply with local laws on studded tire use.

F. Emergency equipment and tools carried inside vehicles shall be secured.

G. Securely anchor weight ballasts in pickup trucks, if needed. Do not use rocks or boulders.

H. If vehicles or equipment to be used or transported are equipped with hydraulic lifts, ensure that they are secured in place with safety locks or other devices to prevent accidental lowering.

I. Before adjusting the chassis of a dump truck with the dump box in an elevated position, secure body with props to prevent accidental lowering.

J. Use only approved-type safety cans for storage and transportation of gasoline and other flammable liquids. Approved metal cans carried in a pickup bed with a plastic liner can become high ly charged with static electricity. Grounding is to be done by placing the safety can on the ground or by using grounding devices.

4.5 **Trailers Less Than 10,000 lbs. GVW.** All drivers towing trailers must be properly qualified and authorized.

A. Vehicles towing trailers must comply with local, State, and Interstate Commerce Commission (ICC) regulations concerning size and weight of towing vehicle. Towing vehicles must have sufficiently heavy brakes and be heavy enough to ensure complete braking control in stopping and holding trailer.

B. All trailers shall be equipped with suitable warning devices (i.e., reflective triangles) for use in emergency situations.

C. All trailers shall be equipped with standard work able trailer lights and stoplights.

D. All horse and similar trailers shall be equipped with trailer jacks or loading gear.

E. Use of a safety chain is mandatory.

F. Trailers, having 1,500 pounds gross trailer weight and over must be equipped with brakes adequate to stop and hold the trailer.

G. Electric breakaway switch to automatically apply trailer brakes is required.

TOPIC 5
HEAVY EQUIPMENT

5.1 References

A. OSHA Standards

1926.600	Equipment
1926.602	Material Handling Equipment
1926.604	Site Clearing
1926.1000	Rollover Protective Structures (ROPS) for Material Handling Equipment
1926.1001	Minimum Performance Criteria for Rollover Protective Structures for Designated Scrapers, Loaders, Dozers, Graders, and Crawler Tractors
1926.1002	Protective Frame (ROPS) Test Procedures and Performance Requirements for Wheel-Type Agricultural and Industrial Tractors Used in Construction
1926.1003	Overhead Protection for Operators of Agricultural and Industrial Tractors
1928.51	Rollover Protective Structures, Agriculture
1928.57	Guarding of Farm Field Equipment

5.2 Procedures

A. **Heavy Equipment Operators.** Bureau operators of Government-owned or leased heavy equipment must have a valid state driver's license and Bureau authorization. Prior to authorization, operators must study and comprehend the operator's manuals for the equipment they will be authorized to operate.

Prior to operating specialized equipment, including dozer, loader, grader, etc., proper training will be completed and documented.

B. **Hazardous Conditions.** Under hazardous conditions or in hazardous locations (i.e., weather conditions or environmental features that increase risk), radio contact should be maintained with operators. When contact cannot be maintained, another employee should accompany operators.

C. **Compliance with Applicable Regulations.** Load weight, width, height limits, and other requirements for transporting equipment and materials shall be observed. Loads shall be secured and flagged as required.

D. **Job Hazard Analysis.** Prior to operating equipment and performing job tasks, a Job Hazard Analysis (JHA) will be completed. The JHA will be completed jointly by supervisor and employees and reviewed by the safety manager.

E. **Personal Protective Equipment and Other Safety Equipment.** Personal protective equipment (PPE) will be provided and used in accordance with OSHA requirements and NPS Reference Manual 50B,Section 16. Rollover Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) will be installed on equipment as required by the OSHA standards previously referenced. Seat belts will be installed and used on all equipment equipped with ROPS or FOPS. Backup alarms will be installed on all bi-directional heavy equipment such as rollers, compactors, loaders, track-mounted excavators, dump trucks, bulldozers, etc. The alarms will be maintained and operable at all times, and will be audible above the background noise at the work site.

F. **Timber Operations.** Tractors/crawlers used in fire suppression work, brushing, or pioneering will be equipped with a logging package including sweeps, side screens, additional uprights, rollover protection, etc. Work area should be assessed for hazards, such as dangerous snags, green trees, trees uprooted while piling brush, blowdown, etc.

5.3 **Other Machinery — General.** Investigate and correct hazards before moving machines into operating positions. Locate and operate machines where there is no danger of blasts, cave-ins, etc. Don't move machines into blasting area until instructed to do so by foreman or blaster in charge.

A. **Basic Safety Rules**

1. Provide heavy-equipment operator with an observer when needed to ensure safety or to assist with work.

2. When changing operators, make sure that person in charge discusses plan of work, existing hazards, hand signals, etc., with new operator and crew.

3. Don't stand directly in front or in back of a self-propelled machine while it is being started.

4. Don't go under or around equipment without notifying operator. Look out for hazards.

5. Never get on or off moving equipment.

6. Rope off area of swing to provide ample clearance for a person between any solid material and tail swing of a dragline, shovel, or crane.

7. Stop all engines before refueling. When filling gasoline tank, keep funnel or container in contact with tank to prevent static spark. Never fill tank over a hot engine. Provide grounding as appropriate.

8. Always leave machines with movable parts that are lowered by gravity, such as shovels, buckets, and skip loaders, resting on the ground while not operating.

9. Don't operate internal combustion engines indoors, except with proper ventilation.

10. Have a qualified person inspect machinery or equipment, including that under contract, when it's received or repaired. Be sure it's in safe operating condition before turning it over to the operator.

11. Have operators continually inspect their machines for safe operating conditions. Promptly notify supervisors when repairs are needed. Shut down defective machinery until repairs are made.

12. All gears, sprockets, shafts, augers, drive belts or chains, pulleys, drums, gears, fans, or other hazardous moving parts must have guards. Replace guards after any repairs are completed.

13. Install operating platforms surfaced with nonskid materials on footwalks, ladders, steps, handholds, guardrails, and toeboards before operating machine.

14. Provide suitable protection for the operator against falling objects, swinging loads, and similar hazards.

15. Use safety glass in shields, cabs, or enclosures on machines.

16. Post signalman at dangerous or congested points near crews, blind areas, camp, etc.

17. Check route of travel for hazards such as insufficient overhead and side clearance, bridges, high-tension lines, etc.

B. **Battery Servicing.** Remember to exercise caution; recharging batteries generates explosive hydrogen gas. Acid can cause severe burns. Always use appropriate PPE such as face shield, gloves, etc. An eyewash station must be provided within 25 feet. "No Smoking" signs shall be posted.

1. Use battery chargers in well-ventilated areas free of sources of ignition.

2. Shut off battery charger before batteries are connected, disconnected, or tested. Place a sign stating the procedures on or near the battery charger. Prior to charging battery, cap vents must be checked to ensure function.

3. In preparing electrolyte solutions, pour acid slowly into the water. Never pour water into the acid.

4. Keep battery acid away from skin, clothing, and metal.

TOPIC 6

OCCUPATIONAL HEALTH HAZARDS/INDUSTRIAL HYGIENE

6.1 References

A. Executive Order 12196

B. 370 DM 792.7 Medical Surveillance Program

C. 485 DM 17 Occupational Health (Industrial Hygiene) Program

D. 29 CFR 1910.1020 Employee Exposure and Medical Records

E. 29 CFR 1910.95 Occupational Noise Exposure

F. 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

G. 29 CFR 1910.134 Respiratory Protection

H. 29 CFR 1910.1000 Air Contaminants

I. 29 CFR 1910.1200 Hazard Communication

J. 29 CFR 1910 Subpart H Hazardous Materials

K. 29 CFR 1960 Subpart C Standards

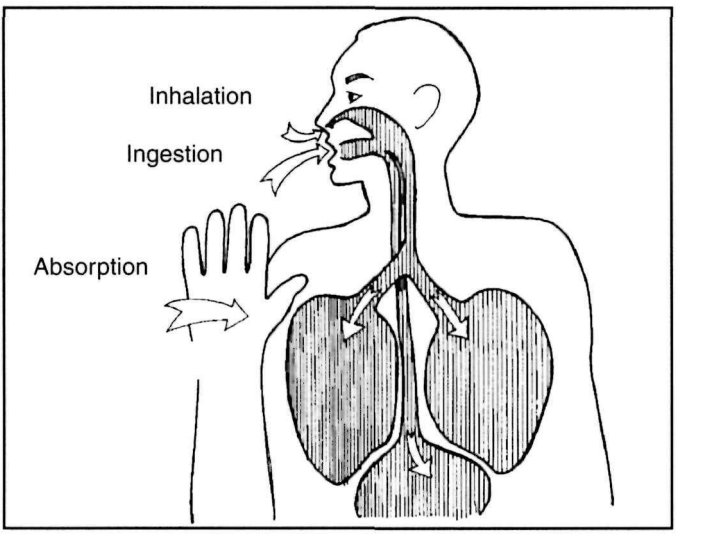
L. NPS Reference Manual 50B, Section 11

6.2 **Procedures.** Because of the potential for exposing employees and volunteers to unhealthful, noisy, and ergonomically incorrect work environments, it is imperative that safety managers assist in designing workplace settings that inhibit such conditions. It is also important to ensure that designs and conditions are planned and prepared in a manner that ensures the safety and health of the visiting public. Employee exposure and medical records will be maintained in accordance with 29 CFR 1910.1020.

A. **Health Hazards.** Health hazards may exist in a wide spectrum of chemical forms, including: mist, liquid, vapor, gas, dust, and fumes.

B. **Routes of Entry.** Employees may be exposed to health hazards in the following ways: skin absorption, inhalation (air contaminants), injection, and ingestion through poor hygiene practices (see Illustration 6-1).

Illustration 6-1 Routes of Entry Inhalation



C. **Standards of Exposure.** To safeguard workers against health hazards, there are specific standards and exposure limits for each type of exposure. The limits sometimes have very strict boundaries between what is safe and unsafe. The safety manager or industrial hygienist should be consulted concerning standards of exposure.

D. **Reducing or Eliminating Employee Exposure.** Once an industrial hygiene evaluation has been conducted and a hazardous exposure has been identified, immediate action must be taken to reduce the exposure, as outlined below.

1. **Engineering Controls.** The most effective and inexpensive engineering controls are designed into the facility or process before construction. For existing construction, personal protective equipment (PPE) will be required as an interim measure until engineering controls are implemented.

   a. **Ventilation Controls**

      1. Local exhaust ventilation installed in an enclosure, or as close as possible to the point of contaminant generation, is much more effective and provides better protection than general or building ventilation.

      2. Ventilation systems frequently are ineffective if adequate make-up air is not provided. Temper (heat) make-up air before it is introduced into the workplace in winter.

      3. For information regarding lab safety, refer to 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories, or consult the safety manager.

      4. Many well-designed systems fail to protect employees because maintenance is minimal or nonexistent after installation. Regularly scheduled maintenance of environmental control systems must be provided to ensure continued employee health protection.

2. **Work Methods as Controls.** Safe work practice, proper equipment, and good housekeeping will minimize unnecessary exposure to spilled substances. A house keeping program must be established at each facility to clean up any spills of nontoxic substances promptly, and for regular cleanup and maintenance.

   a. **Vacuum Cleaning.** Vacuum cleaning is the most efficient method of collecting settled dust particles without causing appreciable re-entry into the workplace air. Blowing the settled dust particles with an air hose should never be done.

   b. **Wet Methods.** When vacuum cleaning equipment is not available, wet methods, such as using water and/or other wetting agents to remove dust particles on floors, may be done to minimize air borne dust caused by sweeping.

   c. **Cleaning Up Liquid Spills.** Contact the Hazardous Materials Program Coordinator in the event of a chemical or toxic spill.

3. **Administrative Controls.** Administrative controls assist in reducing employee exposure. Time exposure limitation is achieved by rotating jobs or by reducing work periods. At best, administrative controls should only be used for brief periods until engineering corrections can be implemented.

4. **Personal Protective Equipment (PPE).** Some operations are not amenable to engineering controls, so PPE may be the only practical way to limit employee exposure. PPE may also be used for brief periods during

repair of engineering controls and/or to ensure greater personal protection. It is essential that PPE be fitted to the individual employee and that the employee be carefully trained in the use and limitations of the equipment.

5. **Substitution/Isolation.** Eliminate or minimize, to the extent possible, hazardous materials, equipment, or processes by replacing all or part of the hazardous elements. Carefully investigate all substitutions to ensure that new hazards are not introduced. Hazardous processes may be isolated or enclosed to eliminate employee contact.

6.3 **Respiratory Protection Program.** This program applies to all personnel whose duties require wearing respiratory protective equipment. It is intended to prevent exposure to airborne contaminants greater than permissible exposure limits (PEL) established by OSHA standards. In the absence of OSHA standards, use guidelines established by agencies such as the National Institute for Occupational Safety and Health (NIOSH), the American Conference of Governmental Industrial Hygienists (ACGIH), and the Environmental Protection Agency (EPA). Respiratory protection must not be considered a substitute for installing engineering controls to reduce hazardous conditions. When engineering controls are not possible or feasible, in case of an emergency, or when working with carcinogens, these respiratory protection measures must be implemented.

A. **General Requirements.** Assign respirators only to workers who have been determined by a physician to be physically able to perform the work and use the equipment. The physician should determine which health and physical conditions are limiting. The respirator user's medical status should be reviewed annually by a physician.

1. **Personnel in charge of operating activities** must route all requests for the requisition of respirators through the safety mana-ger for approval to ensure that the proper equipment is properly matched to the level of hazard. Acquisition of the equipment is the responsibility of the operating activity.

B. **Classification and Description of Respiratory Protective Devices.** Respiratory protective devices generally fall into two categories: air purifying and atmosphere supplying.

1. **Air-purifying respirators** remove contaminants from the atmosphere. This type of respirator cannot be used in oxygen-deficient atmospheres. Half-mask respiratory devices cover the nose, mouth, and chin, and do not afford protection against eye rritation from exposure to airborne contaminants. Full facepiece devices cover a larger facial area, including the eyes.

2. **Air-supplying devices** are used in oxygen deficient atmospheres, defined as less than 19.5 percent oxygen.

C. **Respirator Training.** Qualified personnel must conduct training for both supervisors and workers. Training must be documented and maintained by the local field office. Minimum training includes the following:

1. Instructions on the nature of the hazards (whether acute, chronic, or both) and a description of what may happen if the respirator is not used.

2. A discussion of the respirator's capabilities and limitations, including recognition of the end of the service life of cartridges/canisters or filters (e.g., tasting or smelling of contaminants), manufacturers' expiration date, or increased breathing resistance.

3. Classroom and field training to recognize and cope with emergency situations.

4. Instructions on cleaning and maintaining a respirator.

D. **Training Records.** Local records of respirator training, facepiece fit, and leak testing must be kept for at least the duration of employment of the user or as specified by specific contaminant exposure.

E. **Facepiece Fit and Leak Testing.** Each respirator wearer must receive fitting instructions, including demonstrations and practice on how the respirator is to be worn, how to adjust it, and how to determine whether it fits properly.

1. Before initial use, each respirator must be properly fitted, leakage tests performed, and the face piece seal tested.

2. Good face piece-to-face seals cannot normally be obtained when the wearer has a beard, long sideburns, or a skull cap that projects under the face piece. Facial deformities, such as scars, deep skin creases, prominent cheekbones, severe acne, and the lack of teeth or dentures can prevent a respirator from sealing properly. Individuals with any of these conditions should be precluded from using any respiratory protection devices.

3. Sealing tests for routine donning of respirators, which consist of both positive and negative pressure tests, must be performed each time the respirator is worn.

4. **Warning properties.** Odor, as well as eye and respiratory irritation, should alert the wearer that the respiratory protection is malfunctioning or inadequate. This may be the result of improper facepiece fitting, old/inappropriate cartridges or canisters, etc. The worker should leave the hazardous area and rectify the problem. The worker must notify the supervisor if the condition persists. It should be noted that some chemicals and substances have no warning properties.

F. **Maintenance and Cleaning.** When respirators are issued to individuals, the responsibility for primary maintenance and cleaning of the respirrator rests with the user. Equipment must be properly maintained, in accordance with manufacturers' specifications, to retain its original effectiveness.

6.4 **Hearing-Conservation Program.** The hearing conservation program must comply with 29 CFR 1910.95 and address the points identified in the following:

A. **General Requirements.** Implement hearing conservation programs at workplaces where noise exposures for an eight-hour time-weighted average (TWA) are 85 decibels measured on the A scale (dBA) or higher. The exposed employees must be provided with, and required to use, hearing protectors. Workplaces where exposure to noise equals or exceeds an eight-hour TWA of 85 dBA (permissible exposure during an eight-hour shift) must be identified and employees' hearing tested annually.

1. Warning signs indicating high noise levels and the requirement that hearing protectors must be worn shall be posted in work areas or on equipment where the noise level is 85 dBA or higher.

2. Audiometric test results will be maintained in the employee's medical folder as required by 29 CFR 1910.95.

3. No employee will be exposed to the following noise levels without protection in excess of 115 dBA for one-fourth hour or in excess of 85 dBA eight-hour TWA.

4. Employees or their representatives will be provided noise measurements upon request. Audiogram results will be provided to tested employees.

B. **Identification of Exposed Employees.** A roster will be maintained at the local level of employees at risk to noise hazardous situations and revised as necessary. These employees must be included in all aspects of the hearing-conservation program.

C. **Hearing-Protection Devices.** Supervisors shall proprovide and replace as necessary a variety of hearing-protection devices (HPD) for all employees in a designated high-noise area. Hearing protection is provided at 85 dBA and is mandatory at 90 dBA.

1. Each employee will use and maintain the HPD as originally intended. Re-usable insert type HPDs should be disposed of or cleaned after each use and stored in a sanitary location.

2. Supervisors will evaluate the HPD for effectiveness in the particular environment in which it will be used.

3. Employees shall be trained in the selection, use, and maintenance of HPDs and shall be responsible for using them in designated high-noise areas.

6.5 **Hazard Communication Program.** The Hazard Communication Program (Employee Right-to-Know) encompasses handling and storage of hazardous materials (products) in the workplace. The Hazard Communication Program does not apply to hazardous waste, tobacco or tobacco products, wood or wood products, articles (as defined in 29 CFR 1910.1200(c)), food, drugs, cosmetics, alcoholic beverages, or products/ substances used in the workplace in the same manner as household use.

A. **Manufacturers' Instructions.** Manufacturers' instructions for safe handling and storage should be followed.

B. **Hazard Determination.** The manufacturer, supplier, or employer must evaluate chemicals to determine the hazards. Normally, this evaluation is done by the manufacturer and provided via a Material Safety Data Sheet (MSDS).

C. **Material Safety Data Sheet.** The MSDSs are to be available at the point of use. Consult the product MSDS for information regarding:

Physical and chemical characteristics
(flash point, vapor pressure)
Physical hazards (fire, explosion, reactivity)
Health hazards
Primary routes of entry
Permissible Exposure Limit (PEL) or
Threshold Limit Value (TLV)
Carcinogenicity
Safe handling procedures
Control measures (engineering controls,
work practices, PPE
Emergency and first-aid procedures

D. **Employee Training.** Supervisors shall ensure that employees using hazardous materials have been trained as mandated in 29 CFR 1910.1200 Hazard Communication Standard.

E. **Hazard Communication Plan (HazCom Plan).** Each facility is required to have a written HazCom Plan. That plan includes information on:

Site-Specific Policy
Nonroutine Tasks
Employee Information
Informing Contractor Employees
Inventory of Hazardous Materials
Waste Minimization

1. **Waste Minimization.** It is essential that employees, supervisors, and managers incorporate waste-minimization practices into procurement, use, and disposal of hazardous substances.

   a. Waste minimization should be promoted by:

      1. substituting less hazardous products when feasible;
      2. reducing to a minimum the number and variety of products used;
      3. purchasing only the amount absolutely needed;
      4. controlling product storage and handling practices to reduce damage and loss;
      5. separating incompatible products during handling and storage and ensuring storage facilities are properly built, located, and equipped; and
      6. planning work projects in a manner that prevents the acquisition of excess products and materials.

F. **Labeling.** All products must be properly labeled to include:

Contents
Appropriate Warning
Name and Address of Manufacturer
Cross-check with MSDS

Note: Pesticides are excepted from the HazCom labeling requirements.

G. **Storage/Handling of Hazardous Materials.** Storage/handling of flammable and combustibles shall be in compliance with 29 CFR 1910.106. This is outlined under Topic 10, Materials Handling and Storage.

6.6 **Hazardous Materials Management.** The NPS is required to comply with all Federal environmental and safety laws and regulations governing storage, handling, and use of hazardous materials, and governing disposal of hazardous waste. NPS must also comply with state hazardous materials laws and regulations, as required.

A. **Hazardous Materials in the Field.** Any employee may encounter hazardous materials situations in the field. Hazardous materials or waste may be found on public lands in a variety of forms, such as clandestine drug lab waste, mining wastes, midnight dumping, and transportation accidents. Employees who may encounter such situations in the field must be trained as mandated by OSHA 1910.120(q), First Responder Awareness Level, to recognize, retreat, and report any discovery.

1. **Clandestine Drug Lab Waste.** This waste material is often the result of illegal manufacturing of the drug commonly known as "methamphetamine" or "crank." The waste may look like household garbage at first glance. Drug

lab waste can be identified by the presence of gallon plastic jugs, large plastic bags, 5-gallon buckets, and various laboratory equipment (beakers and tubes). Drug lab waste may contain any number of chemical combinations and should be considered dangerous. Employees shall retreat from the area immediately, and report to the program manager (i.e., Supervisor, HazMat, Law Enforcement Ranger, or Special Agent). Do not examine, investigate, touch, smell, or taste such waste for any reason.

2. **Midnight Dumping.** The presence of barrels or other containers, discoloration of land, plants, or water, and the presence of dead vegetation or animals may recognize a midnight dumping on public lands. Upon discovery of midnight dumping waste, retreat from the area immediately and report to the program manager (i.e., Supervisor, HazMat, Law Enforcement Ranger, or Special Agent). If you discover a midnight dumping site, remember that **self-protection is your primary responsibility.**

3. **Transportation Accidents.** Truck, rail, or pipeline accidents on public lands may result in danger to life, property, or resources. When encountering such an accident, take steps to protect yourself by retreating from the area and reporting to the District Hazardous Materials Coordinator.

6.7 **Hantavirus.** Hantavirus is a respiratory disease caused by a virus carried by the deer mouse and other rodents, such as squirrels, rats, and chipmunks. Humans acquire the infection after exposure to rodent excreta, especially after it dries and becomes airborne and is directly introduced into broken skin, eyes, nose, mouth, or possibly ingested with contaminated food or water. Employees who enter gas-metered houses, work in the

renovation of old buildings, or clean up existing areas that may have rodent excreta may be at risk of the disease. All rodents should be treated as if they carry the virus.

A. **General Precautions**. Avoid direct contact with rodents (live or dead), their droppings, urine, saliva, nests, or other items that may be contaminated by them. Do not feed mice, chipmunks, or other rodents. Preventive measures should be taken to eliminate rodents from buildings by reducing the availability of food sources, nesting sites, and access routes into a building.

B. **Elimination of Rodents Inside Buildings and Reducing Rodent Access.** Rodent infestation can be determined by direct observation of animals, from the presence of feces, and from evidence that rodents have been gnawing at food. If rodent infestation is detected inside a building, rodent-abatement measures should be undertaken.

1. Prior to any cleanup, ventilate closed buildings or areas inside buildings by opening doors and windows for at least 30 minutes. Use an exhaust fan or cross-ventilation if possible. Leave the area until airing-out period is completed.

2. Seal, screen, or otherwise cover all openings into the building that have a diameter of one-fourth inch or greater, because rodents can enter through holes this small. Pay special attention to openings where pipes and wires enter the building. It is best to plug holes with sheet metal or metal screening material.

3. Trap rodents using spring-loaded traps. Traps should be placed on a newspaper, along suspected paths like baseboards, or near the corner of a room. Do not use live traps.

4. Rodenticide should only be considered for rapid knockdown of heavy rodent infestations and elimination of rodents in areas of known hantavirus.

C. **Cleanup of Rodent-Contaminated Areas.** Areas with evidence of rodent activity should be thoroughly cleaned to reduce the likelihood of exposure to Hantavirus-infected materials. Cleanup procedures must limit the potential for aerosolization of dirt or dust from potentially contaminated surfaces and household goods.

1. Employees involved in a cleanup should wear rubber or plastic gloves when handling rodents or their nests, or cleaning infested areas. In heavily rodent-infested areas, workers should wear coveralls, rubber boots or disposable shoe covers, and protective goggles. When removing rodent nests or rodents from traps, and cleaning up infested areas, workers should wear a half-face airpurifying respirator or Powered Air Purifying Respirator equipped with High Efficiency Particulate Air filters. Respirator use practices should be in accord with a respirator program and should be supervised by a knowledgeable person.

2. Spray dead rodents, rodent nests, excreta, and foods or other items that have been tainted by rodents with a general-purpose household disinfectant or a prepared disinfectant bleach solution using 3 tablespoons or capfuls of household bleach in 1 gallon of water. Soak the contaminated items thoroughly and place in a plastic bag. When cleanup is complete (or when the bag is full), seal the bag, then place it into a second plastic bag and seal. Dispose of the bagged materials by burying them in a 2- to 3-foot-deep hole. If burying is not possible,

contact the local or state health department about other appropriate disposal methods.

3. After the above items have been removed, disinfect all floors, countertops, cabinets, and other durable surfaces with a solution of water, detergent, and disinfectant. Do not sweep with a broom or vacuum until the area has been soaked with disinfectant. Launder contaminated bedding and clothing with hot water and detergent.

4. After cleanup is completed and when removing gloves, wash gloved hands in a disinfectant and then in soap and water. Thoroughly wash hands with soap and water after removing the gloves. Do not reuse rubber or plastic gloves. They should be disposed of in the plastic bags containing the rodent carcasses, nests, and/or feces.

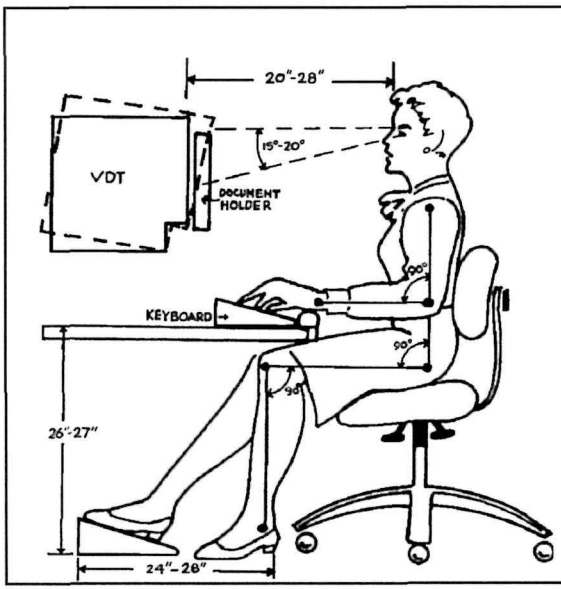
D. **Symptoms of Hantavirus.** Early treatment is crucial. Symptoms may appear one to six weeks (usually two to three) after contact and include fever, nausea, headache, muscle aches, cough, and increasingly acute respiratory trouble. Seek prompt medical attention if you suspect you have been exposed to hantavirus.

6.8 **Ergonomics.** Ergonomics is the study of the relation ship between the worker and the work environment. It recognizes that work methods, equipment, facilities, and tool design all influence the worker's fatigue, motivation, productivity, and the likelihood of sustaining an occupational injury or illness.

A. **Principles of Ergonomics.** The objective of ergonomics is to adapt the job and workplace to the worker by designing tasks, workstations (see Illustration 6-2), controls, displays, safety devices, tools, lighting, and equipment to fit the worker. Some jobs expose workers to excessive vibration

and noise, eye strain, heavy lifting, and repetitive motion. Also, workplace tempera ture extremes may aggravate or increase ergonomic stress.

Illustrations 6-2



B. **Types of Injuries.** Pulled or strained muscles, ligaments, tendons, and disks are the most common back problems. The majority of workplace back disorders result from chronic or long-term injury to the back rather than from one specific incident. Back disorders are frequently caused by excessive or repetitive twisting, bending, and reaching; carrying, moving, or lifting loads that are too heavy or bulky; staying in one position for too long; poor physical condition; and poor posture. Cumulative trauma disorders (CTDs) are disorders of the musculoskeletal and nervous systems that are caused or made worse by repetitive motions or prolonged activities. Other risk factors for cumulative trauma and back disorders include:

1. forceful exertions, usually with the hands,
2. pinch grips,
3. prolonged static postures, either sitting or standing,
4. awkward postures of the upper body, including reaching above the shoulders or behind the back,
5. excessive bending or twisting of the wrist,
6. continued elevation of the elbow,
7. inappropriate or inadequate hand tools,
8. restrictive workstations and inadequate clearances,
9. vibration from power tools,
10. improper seating or support,
11. poor body mechanics, and
12. lifting heavy objects or objects of abnormal sizes.

The combined effect of several risk factors often results in the onset of CTDs.

C. **Hazard Prevention and Control.** Ergonomic hazards are prevented primarily by the effective design of a job or job site and the tools or equipment used in that job. Based on information obtained in an analysis of the work site, procedures can be established to correct or control ergonomic hazards using the following methods:

1. **Engineering Controls.** Workstations should be designed to accommodate the full range of required movements of the workers who are actually using them to perform the job. Attention should be given to prolonged or sustained exertion of a body part, proper work activity height, the reach at which tasks are performed, and the force require ments. Other factors to look at include hard or sharp edges, contact with thermally conducting work surfaces, proper seating, work-piece orientation, lighting, and layout of the workstation.

2. **Work Practice Controls.** Key elements include instruction in proper work techniques, employee training and conditioning, regular monitoring, feedback, adjust ments, modification, and maintenance. For example, after employees are trained in a particular work activity, such as proper lifting, workers should be monitored to ensure that they continue to use proper techniques. Improper practices should be corrected to prevent injury.

TOPIC 7

PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

7.1 References

A. **OSHA Standards.** Subpart I Personal Protective Equipment.

29 CFR 1910.132 General Requirements

29 CFR 1910.133 Eye and Face Protection

29 CFR 1910.134 Respiratory Protection

29 CFR 1910.135 Occupational Head Protection

29 CFR 1910.136 Occupational Foot Protection

29 CFR 1910.137 Electrical Protective Devices

29 CFR 1910.252 Welding

29 CFR 1910.1030 Bloodborne Pathogens

B. 29 CFR 1926 Subpart E Personal Protective and Life-Saving Equipment

C. NPS Reference Manual 50B, Section 16

D. 370 DM Appendix A

7.2 **Procedures.** Field offices shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). Refer to 1910.132 General Requirements for guidance.

A. **Using the Job Hazard Analysis to Determine Appropriate PPE.** The Job Hazard Analysis (JHA) process is used to identify hazards in a job task (see Topic 1). The JHAs are reviewed by the local safety officer to ensure PPE meets appropriate standards (ANSI, NIOSH, MSHA).

B. **Mandatory Use of PPE.** When specific PPE is found necessary and is purchased, it is mandatory for the employee to use such equipment. Should an employee fail to do so, it is the supervisor's responsibility to take the necessary steps to ensure compliance, including appropriate disciplinary action within the guidelines of DM 370.

7.3 **Eye and Face Protection.** Protective eye and face shields shall be required when there is a reasonable probability of injury that can be prevented by use of such equipment. Eye protection shall meet ANSI 287.1.

A. **Goggles and Glasses.** Use goggles, safety glasses, face shields, or welder helmets when subjected to the following:

1. Small flying particles when cutting, drilling, scaling, and grinding metals; cutting, chipping, or dressing stone and brick; woodworking; overhead pruning; brushing; and machine plating.

2. Flying objects when hand drilling, chipping, caulking, riveting, quarrying, rock cutting and crushing, or when using a cyclone seeder or brush cutter.

3. Concentrations of cement or other dust, or dust and sand when sandblasting.

4. Hot metal when handling babbitt or pouring lead joints, or shaping metal on an anvil.

5. Gases, fumes, and liquids when handling acids and caustics such as sulfuric or muriatic acids, ammonia or creosote.

6. Injurious radiant energy and flying hot particles.

7. Grinding wheels. Wear goggles, glasses, or face shields at all times when using grinders or buffer wheels.

8. Welding. Appropriate eye protection shall be worn. Refer to 29 CFR 1910.252(e)(2) when purchasing eye protection.

9. In field situations where eye injury hazards such as brush, twigs, and limbs exist.

B. **Care of Goggles**

1. Keep goggles in protective containers.

2. Wipe the lenses frequently with a clean cloth or soft tissue.

3. Keep goggle frames, including side screens, free from dust and grit.

4. Change headband frequently, keeping the webbing flat.

5. Treat lenses to prevent fogging when necessary, or use goggles ventilated around the lenses.

6. Replace goggles when they become scratched, pitted, or otherwise damaged in a way that inhibits visibility.

7.4 **Head Protection.** Protective headgear shall be required where there is a reasonable probability of injury, which could be prevented by use of such equipment. Refer to 29 CFR 1910.135. Head protection shall meet ANSI 289.1 standards.

A. **Hard Hats.** Hard hats must be worn when working in all construction activities, working in confined spaces, or engaged in active fire suppression work. Hard hats must be worn if there is danger from falling or flying objects or in timber areas due to danger of falling loose bark, limbs, or weak tops.

B. **Nonconductive Hard Hats.** Wear electrically insulated hard hats, if working near electrical conductors.

C. **Proper Fit and Care.** Adjust headband and hammock to fit snugly, with an air space of onehalf inch or more between the head and top of crown of hat. Wear hard hat evenly centered to protect head properly. Clean and sterilize headband and hammock regularly. Integrity of head protection is essential; therefore, head protection shall be replaced when it becomes dented or damaged (some paints weaken integrity).

7.5 **Respirators.** Use of respirators shall be required when there is a reasonable probability of injury that could be prevented by use of such equipment. Respirators must provide adequate protection against the particular hazard for which they were designed and must be approved by the National Institute for Occupational Safety and Health (NIOSH) and Mine Safety and Health Administration (MSHA).

7.6 **Hand Protection.** Use of hand protection shall be required when there is a reasonable probability of injury that could be prevented by use of such equipment. Appropriate hand protection will be provided for the task. It is especially important when working with chemicals to ensure that the appropriate glove is selected for the chemical being used.

7.7 **Out-of-the-Ordinary PPE.** The selection of appropriate out-of-the-ordinary PPE, such as safety boots, prescription eyewear, etc., must be made in consultation with local safety managers/coordinators.

A. **Procedures for Purchase.** Use the following procedures to document the need for out-of-the-ordinary PPE, secure approvals, and initiate procurement:

1. The employee or his/her supervisor initiates requests for PPE.

2. The supervisor and the employee(s) shall work together to develop a JHA that identifies job hazards and proper abatement procedures. PPE will sometimes be part of this hazard abatement. The JHA will be reviewed by the safety officer to ensure compliance with OSHA standards, NPS policy, and ensure that PPE meets appropriate standards.

3. The supervisor is responsible for providing the servicing procurement office with the signed requisition and a copy of the JHA for acquisition. Where credit cards are used, the JHA will be necessary.

TOPIC 8

FIRE SAFETY

8.1 **References.**

A. 29 CFR 1910.35-39, Means of Egress.

B. 29 CFR 1910.157-165, Portable Fire Suppression Equipment

C. 29 CFR 1926.150-155, Fire Protection and Prevention.

D. National Fire Codes.

E. International Building Codes.

F. National Fire Protection Association (NFPA) 101, Life Safety Code

G. 485 DM, Chapter 19.

H. NPS Director's Order 50B/Reference Manual 50B, Section 12.

8.2 **Procedures.** The superintendent/site manager must assure that buildings and facilities are inspected annually by qualified fire inspectors.

A. **Detection Devices.** All facilities used to house employees and their families must be equipped with approved smoke detection devices, residential sprinkler systems, and multi-purpose fire extinguishers. Trailers and other facilities used as sleeping quarters by field crews must be similarly equipped.

B. **Fire Extinguishers.** Place approved and appropriate fire extinguishers inside of repair shops, storage areas, near oil or gas dispensers and in other potentially hazardous areas. Fire extinguishers need to be placed near doors or other areas that have quick accessibility and in a position that does not endanger personnel when a fire emergency arises.

C. **Exits.** Every building designed for human occupancy must be provided with exits sufficient to permit the prompt escape of occupants in case of emergency.

1. One and two family dwellings are to have a second means of escape.

2. Exits and the way of approach and travel from exits must be maintained so that they are unobstructed and are accessible at all times. Widths of aisles and corridors will be in compliance with NFPA 101.

3. All exits must discharge directly to the street or other open space that gives safe access to a public way.

4. Exits must be marked by readily visible, or suitably illuminated exit signs. Specifications for color and size of exit signs can be found in NFPA 101.

8.3 **Emergency Procedures and Evacuation Plans.** Every occupancy for NPS employees, volunteers, or other personnel that is leased or NPS-owned must have an Emergency Procedures and Evacuation Plan that is current and posted on site. See Director's Order 58 for the requirements of a Structural Fire Plan.

A. The plan shall address emergency and evacuation procedures for fire and other emergencies such as bomb threats, chemical spills, earthquakes, sabotage/ecotage, public demonstrations, and civil disobedience. The plan shall be updated annually and shall include:

1. Building evacuation routes.

2. Procedures to account for evacuated employees.

3. Special duties (rescue, medical, physically challenged assistance) and names of designated personnel.

4. Proper reporting procedures.

5. Names and job titles of emergency procedures personnel.

8.4 **Personal Safety for Fire Emergencies.** Federal policies prohibit employees from staying at non-sprinkler-equipped hotels with more than three floors. Although hotels and motels will have smoke detectors and sprinkler systems, self protection is essential.

A. Become familiar with emergency exits, evacuation routes, fire extinguishers, fire alarms, emergency telephone numbers, first aid supply locations, etc.

B. Do not use elevators during fire emergencies.

C. Look over your room. What is outside the window? Can you open the window? Could you jump if necessary? Is there a smoke detector and does it appear to be operational?

D. If there is a fire or you suspect a fire, before opening the door, feel the door and knob with your hand. If hot, do not crack the door. Close vents and cover cracks around doors keeping smoke out of the room.

E. Create the habit of placing your room key and a flashlight in a consistent place where you can grab them on your way out of the room. Always take the key with you. You should close the door behind you to keep smoke and heat out of the room, but you may find conditions in the hall to be unbearable and need to return. The key is vital.

8.5 **Vehicle Fires.** The inherent danger from vehicle fires is from explosions, burns, and asphyxiation. Immediate response is key to your survival. Getting away from the fire is in your best interest. A frequent cause of vehicle fires has been due to ignition of dry grass by hot parts of vehicle exhaust systems, i.e., catalytic converters. If there is time, the following actions can be taken:

A. Turn off ignition.

B. Exit the vehicle and use a fire extinguisher (all service-owned or leased vehicles should be equipped with a useable fire extinguisher). Sand, dirt, a blanket, or a coat may be used to smother flames. Remember that water may be used but petroleum fires react violently to water if not applied correctly.

C. Smoke from vehicle fires may emit noxious and/or fatal emissions from fabrics, petroleum, rubber, and plastics. Avoid these emissions or minimize them when possible.

8.6 **Wildland Fire Safety:** See Director's Order #18.

8.7 **Structural Fire Safety:** See Director's Order #58.

TOPIC 9

FIELD INJURY PREVENTION AND FIRST AID

9.1 References

A. American Red Cross

B. 29 CFR 1910.151 Medical Services and First Aid

C. 29 CFR 1910.1030 Bloodborne Pathogens

9.2 **Procedures.** All employees whose work assignment in the field places them beyond reasonable accessibility to a medical facility in terms of time and distance (15 minutes and/or 10 miles) must be trained to render first aid or be accompanied by someone who has a valid certificate in first aid and CPR.

A. **Camp Safety.** First-aid kits should be available in two central areas (e.g., kitchen, shop area, recreation tent, project leaders tent, etc.). Kits should be large enough to accommodate the number of people in the crew.

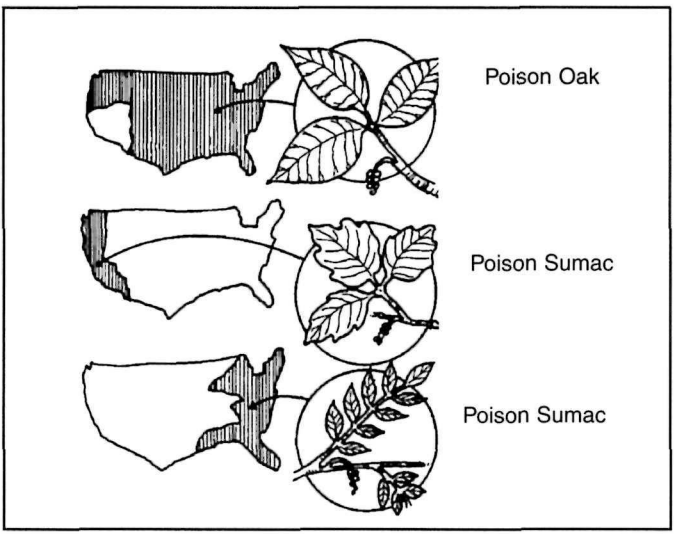
B. **Preventive Inoculations.** Preventive inoculations may be obtained for Rocky Mountain Spotted Fever, certain insect stings, poison oak and ivy, Hepatitis B, or other diseases. Hepatitis A Virus (formerly called infectious hepatitis) is excreted or shed in feces. Direct contact with an infected person's feces or indirect fecal contamination of food, the water supply, raw shellfish, hands, and utensils may result in sufficient amounts of virus entering the mouth to cause infection. Hepatitis B Virus (HBV; formerly called serum hepatitis) is spread through sexual contact, blood transfusions, contaminated needles, contact with body fluids, or from mother-to-child at birth.

1. Inoculations may be obtained at Bureau expense.

2. Inoculations may be administered only if it can be clearly shown that conditions warrant preventive inoculations, that the inoculations are necessary to protect employee health, and that the official duties of the employees expose them to contact by poison or disease.

9.3 **Poisonous Plants.** Instruct all employees subject to exposure to poison sumac, oak, and ivy on how to identify them (see Illustration 9-1). Take extra precautions with persons known to be highly sensitive to poison sumac, oak, and ivy. If practical, do not assign allergic people work in areas where exposure could occur.

Illustration 9-1



A. **Identifying Poisonous Plants**

1. Wear proper field attire. Since dried poison oak resin on clothing can cause a rash if it touches the skin, wash clothing at regular intervals–daily if you are very sensitive.

2. The palms of the hands rarely are affected, but poison oak resin can be transferred from the hands to other parts of the body. It can be removed by rinsing the affected area with water. Wash hands before urinating. Be careful about wiping sweat from the face and around the eyes with your hands.

3. **DO NOT** use unidentified leaves as emergency toilet paper in the field.

4. Tools can be contaminated with the resin. This can be removed by rinsing them with water.

5. **DO NOT** attempt to desensitize yourself by eating the leaves. This can cause severe lesions in the mouth, and around the rectum, and can cause kidney damage.

6. **DO NOT** stand in the smoke of fires made of brush; it may contain unburned particles of poison oak.

7. **DO NOT** use a leaf mulcher in areas with poison oak unless your legs and arms are covered and you are wearing a face shield.

9.4 **Poisonous Insects (Arthropod Stings and Bites).** Employees assigned to areas of heavy arthropod (i.e., ticks, chiggers, spiders, scorpions, bees, wasps, yellow jackets) infestation should do the following:

1. Wear proper field attire as defined in Topic 3. Additional protective clothing or equipment for specific activities will be determined by the Job Hazard Analysis (JHA) process and by management.

2. Secure trousers by tucking pant legs into socks to prevent insects from going up pant legs.

A. **Bee Stings.** Hair sprays, hair tonics, sun lotions, other perfumed toiletries, and suede or leather odors attract these insects and should be avoided. Bright colors and bright metal objects, such as jewelry, belt buckles, etc., also attract bees.

1. Swatting or running appears to aggravate stinging insects. Shield your face with your arms and move slowly out of a danger zone, or lie face down on the ground if under attack. **DO NOT** poke at bee or wasp nests.

B. **First Aid for Bee Stings.** The following applies also to stings from bumblebees, hornets, and wasps. Of these, the honeybee has a barbed stinger that could be left in the skin. The venom sac of the honey bee stinger may be attached and continue to inject venom for some time after the bee has left. The stinger only penetrates into the skin for a very small distance. It should be removed promptly. To avoid squeezing, which would inject more venom, it should be removed by scraping the skin surface with a knife blade or a fingernail.

1. Single stings from any of these insects rarely require medical attention. There may be an immediate sharp pain followed by some redness and swelling. The application of cool water will reduce the intensity and duration of the swelling.

2. Moderate to severe medical emergencies may result from single or multiple bites. Tolerance to bee stings may vary by individual. If a reaction occurs, the victim should be transported for medical care.

3. Some individuals have become sensitized to these stings and react with a widespread rash, asthmatic breathing, tissue swelling, a fall in

blood pressure, and sometimes unconsciousness. This is known as anaphylactic shock. Such employees should carry an appropriate prescription and inform supervisors and co-workers of its location and use. This can be an extreme medical emergency, and such individuals should work only within an area providing fairly rapid transport to a medical facility. These individuals should be advised to wear a Medic-Alert tag or similar device containing information about their sensitivity and emergency phone numbers.

C. **Ticks.** When working in areas infested with ticks.

1. Tuck your pant legs into your socks.

2. Tuck your shirt into your pants.

3. Use a tick repellent on your clothes.

4. Do a body check at the end of each work day, paying particular attention to armpits, navel, behind the ears, and the groin area.

5. At night, place clothing where ticks, spiders, or scorpions cannot get in them. Arrange bedding so insects cannot crawl into it during the day and night.

6. **Tick Removal.** The sooner ticks are removed, the better.

   a. Tweezers work best at removing ticks. If fingers are used, shield them with a piece of paper.

   b. Grasp the tick as close to the skin surface as possible and pull outward with a steady, even pressure. DO NOT jerk or

twist, as this may cause the head of the tick to break off in the skin.

c. Take care not to squeeze, crush, or puncture the body of the tick, as this may cause the injection of fluids from the tick to enter the wound.

d. After removing the tick, disinfect the area with alcohol or soap and water. You may want to keep the tick in a small jar for later identification in case you become sick with Lyme disease or another illness.

e. Folklore methods of tick removal, such as painting the tick with Vaseline, fingernail polish or alcohol or applying a hot matchhead, **DO NOT WORK.**

7. **Lyme Disease.** Ticks carrying Lyme disease can be found in many parts of the United States. The carriers are deer ticks and can be identified by their small size and color (black and reddish-brown).

a. Ticks must be attached to the skin for 12 to 24 hours in order to transmit the spirochete that causes Lyme disease, so prompt removal is a safeguard against disease.

b. **Symptoms of Lyme Disease.** Lyme disease can cause severe health problems if left untreated. Prompt and accurate diagnosis is essential. Symptoms usually develop within a few days to a few weeks after the bite of an infected tick. Symptoms include headache, stiff neck, fever, muscle ache, flu-like symptoms, and general malaise. In approximately 70 percent of Lyme disease cases, a "bull's

eye" rash or lesion is exhibited. If these symptoms occur following tick exposure, seek medical attention.

9.5 **Poisonous Snakes.** Snakes tend to be temperature-sensitive. At cool to cold temperatures, they are slow and lethargic; at hot temperatures, they are quick, but also uncomfortable and will seek cool shelter. On a cool morning, the snake may be sunning on a warm ledge; in the heat of the day, it might be under a rock or brush where it is cool. Be aware also of these other characteristics:

Snakes have excellent camouflage, so train your eye to see the correct shapes and colorations.

Don't underestimate the speed and agility of a snake. Rattlesnakes can strike over a distance of about onehalf their length and can strike faster than you can jump. Give them a wide margin.

Wear clothing and appropriate boots. Be careful when walking in back country, especially if ground is obscured by foliage. Walk on clear paths as much as possible. Don't step over a large log without looking on the other side first.

Watch where you are putting your feet and hands at all times. Don't pick up rocks or other objects that might conceal a snake. Use a tool to turn the rock over first.

A. **First Aid for Snake Bites.** If medical help can be secured within one hour, no first-aid meaures are necessary.

1. Keep still; avoid panic.

2. Get away from the snake.

3. Apply constricting band, 2-inches wide, above the bite.

4. Immobilize extremity.

5. Do not give aspirin.

6. Remember that not all strikes by rattlesnake deposit venom. If there is an absence of pain and swelling shortly after the strike, it was probably a "dry bite." In such a case, extraordinary measures are not indicated. "Dry bites" occur about 20 to 25 percent of the time.

9.6 **Cold Injuries.** Hypothermia and frostbite are the two most common types of cold injuries. Frostbite is local cooling. Most commonly affected are the ears, nose, hands, and feet. When a part of the body is exposed to intensely cold air or liquid, blood flow to that particular part is limited by the constriction of blood vessels. When this happens tissues do not receive enough warmth to prevent freezing. Ice crystals can form in the skin. There are three degrees of frostbite.

A. **Types of External Cold Injuries (Frostbite)**

1. **Frostnip** is the first stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cold air.Wind chill and water chill also can be major factors. This condition is not serious. Frostnip develops slowly, and often a person is not aware of the condition until someone calls attention to it. The affected part blanches, or becomes discolored or pale. As the cooling process continues, numbness replaces any sensation of cold or discomfort.

   a. **Treatment.** A person afflicted with frostnip usually cares for the problem by gently

warming the affected bodypart, holding it in his or her bare hand, blowing warm air on it, or, if fingertips are involved, holding them in the armpits. If for some reason a person is unable to do this alone, another person can take the same steps. Transfer the frostbite victim to a medical facility if it appears he or she has suffered more than a mild case of frostnip.

2. **Superficial Frostbite** is commonly called "frostbite". The outer and inner layers of skin become involved. If frostnip goes untreated, it becomes superficial frostbite. The affected part becomes discolored and pale. It will feel frozen to your gentle touch. However, when the skin is gently pressed, it will feel soft and pliable beneath the frozen area.

   a. **Treatment.** Superficial frostbite treatment includes applying a cover and gentle handling of the affected part. If transportation to a hospital is delayed, apply steady warmth by submerging the body part in warm water. The skin turns purple during thawing and can be painful. The person should receive follow-up medical care.

3. **Deep Frostbite** is where the inner and outer layers of the skin and the deeper structures of the body are affected. Muscles, bones, deep blood vessels, and organ membranes can become frozen. The affected part becomes a mottled or blotchy blue or gray. The tissue feels frozen to the touch, without the underlying resilience that is characteristic of superficial frostbite.

a. **Treatment.** Emergency care for deep frostbite requires the victim to be immediately transported to a hospital. Dry clothing over frostbite will help prevent further injury. The frostbitten part should not be rubbed. Do not apply ointment or cover frostbitten parts with snow. If the tissue is frozen, keep it frozen until care can be initiated. Also, never initiate thawing procedures if there is any danger of refreezing— keeping the tissue frozen is less dangerous than submitting it to refreezing. If blisters appear, do not open them.

B. **Types of Internal Cold Injuries (Hypothermia).** Hypothermia is caused by exposure to cold. It is a condition that occurs when inner body temperature drops to a subnormal level. It impairs a person's ability to think and act rationally and can cause death. It is accelerated by wet or damp clothing, wind, exhaustion, or sudden contact with cold water.

1. **Detection of Hypothermia.** Watch for symptoms of hypothermia in yourself and others whenever out doors. The following are symptoms of hypothermia:

a. Uncontrollable spells of shivering or continuous shivering over a long period of time.

b. Slurred or slow speech; incoherent and vague statements.

c. Memory lapses.

d. Fumbling hands; frequent stumbling; lurching gait.

e. Drowsiness.

f. Exhaustion — inability to get up after a rest.

2. **Treatment.** Move the victim of hypothermia to shelter and warmth as quickly as possible. If shelter is not readily available, immediately build a fire to warm the person. Prevent further heat loss.

   a. Handle the victim with care and prevent him or her from walking around.

   b. If the victim is only mildly impaired, give him or her warm drinks (do not give alcohol) and get him or her into dry clothes and a warm sleeping bag.

   c. If the victim is semiconscious or worse, try to keep him or her awake. Remove the victim's clothing and put him or her in a sleeping bag with another person, also stripped, allowing that person's body heat to warm the victim.

   d. Transport the victim to the nearest medical facility. Transport him or her gently and keep the victim lying down, as still as possible.

   e. Do not ever assume that a person suffering from severe hypothermia is dead, even though he or she may appear to be. There may be no detectable heartbeat, breathing, or any other sign of life. CPR can be given en route to a hospital.

3. **Prevention.** The best defense against hypothermia is to avoid exposure. Recognize hypothermia-producing weather and dress for it. Choose clothing that will keep the body dry and

warm. Check weather conditions and be familiar with the area before trips. Prepare and pack a survival kit to be carried by each person.

9.7 **Heat-Related Injuries.** The body's chemical activities take place in a limited temperature range. They cannot occur with the efficiency needed for life if the body temperature is too high or too low. Heat is generated as a result of the constant chemical processes within the body. A certain amount of this heat is required to maintain normal body temperature. Any heat that is not needed for temperature maintenance must be lost from the body or hyperthermia, an abnormally high body temperature, will ensue. If allowed to go unchecked, it will lead to death.

A. **Heat Cramps** are severe muscle cramps, usually in the legs or abdomen, brought about by dehydration and exhaustion, and sometimes accompanied by dizziness and periods of faintness.

1. **Treatment.** Move the victim to a nearby cool place. Give person water to drink, or half-strength commercial electrolyte fluids. Massage the "cramped" muscle to help ease the person's discomfort.

B. **Heat Exhaustion's** symptoms include displays rapid and shallow breathing, weak pulse, cold and clammy skin, heavy perspiration, total body weakness, and dizziness that sometimes leads to unconsciousness.

1. **Treatment.** Move the person to a nearby cool place. Keep the person at rest. Remove enough clothing to cool the person without chilling him or her (watch for shivering). Fan the person's skin. Give the person salted water or half-strength commercial electrolyte fluids. Do not try to give fluids to an unconscious person. At this stage, treatment at a medical facility is essential.

C. **Heat Stroke** starts out with deep breaths, followed by shallow breathing, then rapid, strong pulse, followed by rapid weak pulse. The skin becomes hot and dry. The victim may loose consciousness, and seizures or muscular twitching may occur.

1. **Treatment.** Cool the victim rapidly in any manner. Move the victim out of the sun or away from the heat source. Remove the victim's clothing and wrap him or her in wet towels and sheets. Pour cold water over these wrappings. Body heat must be lowered rapidly or brain cells will die.

   a. If cold packs or ice bags are available, wrap them and place them under victim's armpits, behind each knee, on the groin, on each wrist and ankle, and on each side of the neck.

   b. Transport the victim to a hospital as soon as possible. Should transport be delayed, immerse the person up to the face in a tub or container of cool (not cold) water. Constantly watch the victim so he or she does not drown. This is a life-threatening, heat-related emergency. CPR may need to be given.

2. **Prevention.** Reduce activity level immeiately and seek a cooler environment. Stay in the shade. Keep food intake, especially intake of protein, to a minimum if sufficient water is not available, since protein increases metabolic heat production and water loss.

   a. Keep clothing on, including shirt and hat. Clothing slows the evaporation rate of perspiration and prolongs the cooling effect, in addition to giving protection from the sun.

b. Drink water to prevent dehydration.

c. Do not sit or lie on the hot ground. It can be up to 30 degrees hotter on the ground than it is just one foot above the ground. To avoid skin burns, avoid sitting on metal surfaces unless material is placed between skin and place of contact.

d. If foot travel is unavoidable, walk only at night and rest often.

9.8 **Lightning-Strike Injuries.** The passage of electricity through the body can either burn tissues or cause only muscle spasms or contractions. Vital nerve centers may be blocked, causing the heart or breathing to stop. Immediate revival should be attempted using appropriate artificial respiration and cardiac massage (CPR) techniques. Be assured, however, that a lightning-shock victim can be touched without any risk of shock to you.

9.9 **Altitude-Related Problems (above 8,000 feet).** Most difficulties at high altitude are a direct result of the lowered concentration of oxygen in the atmosphere. High altitude pulmonary edema (excessive fluid in the lungs) usually occurs in the unacclimatized individual who rapidly ascends to an altitude that exceeds 8,000 feet, particularly if heavy exertion is involved. Symptoms include shortness of breath, coughing up white phlegm, weakness, easy fatigue, rapid heart rate (greater than 90 to 100 beats per minute at rest), nausea, vomiting, headache, insomnia, and acidic taste in mouth.

A. The definitive treatments are descent to a lower altitude at which there were previously no symptoms and the administration of oxygen, if available, by mask at 10 liters per minute. Do not take sleeping pills, alcohol, or smoke cigarettes. Stop strenuous activity.

9.10 **Bloodborne Pathogens.** NPS must comply with OSHA standard 29 CFR 1910.1030. This standard establishes exposure determination, exposure control plan, engineering controls and safe work practices, personal protective equipment (PPE), housekeeping, training requirements, Hepatitis B vaccinations, and post-incident exposure requirements for employees with occupational exposure to blood and other fluids.

A. **Scope.** This standard covers all employees who could, as the result of performing their job duties, be reasonably expected to come in contact with blood, or any body fluid visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.

B. **Exposure Determination.** NPS shall identify those employees and job classifications with occupational exposure to bloodborne pathogens, without regard to use of PPE.

C. **Exposure Control Plan.** Where employees are identified as having occupational exposure, a written Exposure Control Plan shall be established to eliminate or minimize employee exposure. The plan shall include:

1. **Housekeeping and Work Practice Controls.** The employer shall provide antiseptic hand cleaner and/or towelettes, as well as paper towels, where handwashing facilities are not available. Equipment that may be contaminated with blood or other potentially infectious material shall be decontaminated. The contaminated equipment must be labeled. Procedures must be developed for handling sharp objects, such as needles, glass, etc., and for prohibiting eating, drinking, smoking, etc., in work areas.

2. **Personal Protective Equipment.** The employer shall provide, at no cost to the employee, appropriate PPE such as gloves, CPR face shields, bag type resuscitators, etc. The employee shall use the protective equipment when deemed necessary by NPS. Disposable masks, gloves, etc., shall not be washed or decontaminated for reuse.

3. **Training.** Training must be provided for all employees whose job puts them at risk for an occupational exposure. Training must be provided initially, upon assignment, and cover the major elements of the bloodborne pathogens regulation.

4. **Hepatitis B Vaccination.** This vaccination shall be made available, at no cost, to all employees who have the potential for occupational exposure to blood or other potentially infectious material. The vaccine should be administered within 10 working days of assignment. Employees must sign a declination form if they choose not to be vaccinated. The employee may later opt to receive the vaccine at no cost.

D. **Post-Exposure Incident Evaluation.** This evaluation will address medical evaluation for exposed employees and incident evaluation to ensure corrective measures are taken and source testing is conducted.

TOPIC 10

MATERIALS HANDLING AND STORAGE

10.1 References

A. OSHA Standards

29 CFR 1910.132 Personal Protective Equipment

29 CFR 1910.176 Handling Materials — General

29 CFR 1926.250 Materials Handling, Storage, Use and Disposal

29 CFR 1926.550 Cranes and Derricks, Helicopter, Hoists, Conveyors, etc.

29 CFR 1926.602 Material Handling Equipment

29 CFR 1926.953 Materials Handling

29 CFR 1926.1000 ROPS, Protective Frames, Enclosures, etc., on Vehicles

10.2 **Procedures.** Observe established procedures and precautions when lifting, carrying, or otherwise handling heavy loads. Remember that weight, shape, and size of objects determine limits of safe handling. Don't overexert. If help is needed, get it. Use required personal protective equipment (PPE).

A. Lifting Heavy Loads

1. Inspect ground or floor area immediately around object.

2. Inspect route of travel for clearance and tripping hazards.

3. Examine object to determine safest way to handle. Check for snags, burrs, splinters, greasy surfaces, etc.

4. Wear protective gloves and safety shoes.

B. Lifting in a Proper Manner

1. Make a trial lift to be sure load can be handled safely.

2. Stand close to object, with feet solid and slightly apart.

3. Assume a crouching position close to load. Bend legs at knee.

4. Keep back as straight as possible without arching. Leg and arm muscles should do the work.

5. Secure a firm grip on object. Lift by straightening legs.

6. To shift the load to shoulder height or higher, bend knees. Rest object on a bench or ledge. Shift hands and boost.

7. Don't twist. Shift feet to turn body.

8. Make allowances for fatiguing effects of stairs and ramps.

9. Take precautions to avoid bruising or crushing hands and arms in narrow passage ways.

10. Lower object in same manner in which it was raised. Take necessary precautions to keep fingers clear when placing object.

Illustration 10-1

C. **When Two or More Persons Lift**

1. Select persons of similar size and strength.

2. Station one person at rear to give predetermined signals or orders.

3. Carry long objects such as ladders, pipes, and lumber on shoulders on same side. Walk in step.

4. Handle packaged articles in boxes by grasping them at opposite top and bottom corners. Grasp sacked material by opposite corners.

5. Upending full drums is a two-person job. When rolling a drum, push hands on center of the barrel. Snub drums with safety ropes or other tackle on inclines or skids.

6. Provide help for handling odd-shaped objects if combination of irregularities and weight makes them hazardous for one person.

D. **Equipment**

1. Provide a wide range of tools, fixtures, jigs, hooks, crowbars, cribbing, rollers, blocks and tackle, slings, jacks, chain hoists, hand trucks, dollies, etc., for safe handling of materials and equipment.

2. Provide appropriate hand protection.

3. Inspect all tools and equipment frequently to ensure safe operating conditions.

4. Use bolted-down tool boxes to carry loose tools in vehicles. Fasten other materials securely so they don't shift and strike occupants in case of a vehicle accident, or drop out of vehicles.

10.3 **Powered Industrial Trucks and Tractors (Forklifts, etc.).** Each operator is responsible for the safe and careful handling of the equipment. Operators shall be qualified and authorized to operate such equipment, and the authorization shall be noted on individual training records. Equipment and operators shall be in compliance with OSHA 1910.178 and ANSI B56.1-1969.

A. **Minimum Forklift Operation Requirements**

1. Falling Object Protective Structures (FOPS).

2. Backup alarm.

3. Capacity decal.

4. No passenger on lift.
5. No passengers on pallets.

6. Initial training and documentation.

B. Basic Safety Rules for Operating Forklifts

1. Before operating, check brakes, steering, horn, gas, oil, and water levels. Irregularities should be reported to supervisor.

2. Do not exceed the truck's rated capacity or the floor load limits. Take a good look at the load before picking it up. Consider its weight and balance. If load appears unsafe, split load or use other equipment.

3. Pick up load squarely and do not make quick or jerky starts and stops.

4. Never "butt" the loads with the forks or the rear end of a truck.

5. Always face the direction the truck is moving and maintain clear vision of the way ahead.

6. Keep arms and legs inside truck. Do not put them between the mast's uprights nor outside the running lines of the truck.

7. Passengers are prohibited on forklifts and forklift loads.

8. If following other trucks, maintain safe distance.

9. On wet or slippery floors, slow down. Use low gear when descending ramps.

10. Be sure the wheels of highway trucks and trailers at loading docks are chocked.

11. Make certain that bridge plates into trucks are wide enough, strong, and secured.

12. Don't cut corners. Before passing a door way or turning a blind corner, slow down and sound horn.

13. When entering main aisles, intersections, or roadways, come to a full stop; look and sound horn.

14. Watch out for pedestrians.

15. Carry the loads of high-lift trucks 6 inches off the floor and tilted backward for better stability.

16. Always travel forward up ramps and in reverse down ramps.

17. When high-lift trucks are unloaded and in motion, keep their forks near the floor to prevent damage or injury.

18. Be careful in elevating loads. Watch out for overhead and wall obstructions, fire extinguishers, sprinklers, pipes, electrical conduits, switches, etc.

19. Use extreme caution in high tiering.

20. Do not use the fork of a high-lift truck as a personnel elevator, unless a safety platform is attached to the forks.

21. Lower loads slowly and stop gently. Never lift or lower when truck is in motion.

22. Park safely, without obstructing aisles. Before leaving a gas or diesel truck, turn off the engine.

23. Stop the engine when refueling.

24. Lock the truck or remove control handle when not in service.

25. Observe fire-prevention rules. Equip industrial trucks with a fire extinguisher, and make sure that drivers know how to operate it.

26. Use gas-, diesel-, or propane-fueled equipment in well-ventilated areas.

27. Forklift battery management:

    a. Always wear the proper personal protective equipment when changing a battery.

    b. Be aware of the nearest eyewash or shower station.

    c. Shut off the engine.

    d. Do not smoke or have an open flame in the battery-changing area.

    e. Make sure the brake is set on the forklift before changing the battery.

    f. Make sure the battery-lifting device is secure operating lifting it.

    g. Stand clear when moving the battery.

    h. Make sure that the ventilation system is working properly before charging a battery.

    i. Always add battery acid to water — never add water to battery acid.

    j. If charging the battery on the forklift, uncover the battery compartment to prevent the build-up of heat and hydrogen gas.

    k. Make sure that metal objects do not come in contact with the terminals on the battery.

    l. Make sure the charger is off before connecting it to the battery.

m. Make sure the vent caps are not plugged.

n. Make sure charger is properly connected to battery before plugging it into electrical outlet.

10.4 **Storage Yards.** Use a level, well-drained wareyard for storing materials, vehicles, equipment, etc. Storage yard should be fenced in with an 8-foot high, vandal proof fence.

A. Provide adequate roadways and walkways for safe movement of personnel, trucks, lifts, and cranes, etc.

B. Keep storage yards free of surplus material and obsolete equipment that clutter the area.

C. Provide and maintain approved types of fire extinguishers in storage yards.

D. Provide 5- to 8-foot corridors both inside and outside of perimeter fence to facilitate fire control and keep out rodents and snakes.

E. Keep storage area free of vegetation, debris, and rubbish.

F. Use cribbing to prevent direct contact with the ground. Dunnage may inhibit bottom ventilation.

G. Use tarpaulins to protect materials subject to weather and sun damage.

H. Arrange heavy pieces and palletized material in a manner that will allow for mechanical handling.

I. Block or nest round objects to prevent roll. If drums and kegs are piled on end, use planks between layers.

J. Stack piles of lumber. Make the height of the pile no greater than the width.

K. Use cross-binding and stepback methods when storing bagged material and masonry products.

L. Store reinforcing steel and small-diameter pipe on racks. Make permanent separations to prevent pulling from the pile.

M. Provide loading docks and hand trucks for moving heavy and bulky items.

N. Label all barrels according to their contents and properly dispose of unneeded barrels.

O. Sign flammable storage areas as "No Smoking" areas.

P. Ensure that surface of storage yard is protected from contamination by stored liquid materials.

10.5 **Warehouse Storage.** Store materials at safe distances from heating devices such as stoves, steam pipes, heating ducts, and radiators. Store materials in separate areas, according to the degree of hazard. **DO NOT** defeat the effectiveness of fire sprinklers by placing stored materials within the restricted distances (18-inch clear space) established by National Fire Protection Association.

A. Provide adequate aisle space for handling heavy or bulky bounded, stacked, or racked materials. Plainly define aisles and passageways. Keep them free of obstacles and other materials.

B. Plan storage to permit safe lifting and handling and prevent toppling. Don't load storage bins beyond safe capacity.

C. Keep tops of storage bins, racks, and cabinets free of material.

D. Provide racks designed to hold stock of pipes and bars.

E. Don't allow stored materials to exceed safe floor loads. Keep floors clean and in good repair.

F. Keep areas around warehouses and other buildings free of dry grass, vegetation, and debris. Take adequate fire-prevention measures to prevent loss or damage of stored materials.

G. Provide metal containers with tight-fitting covers for disposing of waste packing materials and rubbish. Never permit large amounts of waste material to accumulate in warehouse.

H. Provide adequate illumination for storage and warehouse operations. (See 29 CFR 1926.56.)

I. Store compressed gas cylinders in cool, dry, well-ventilated places. Close valves tightly. Keep protective caps in place. Place cylinders upright and fasten securely. Store cylinders compatibly. (For example, oxygen and acetylene must be stored separately.) Separate full and empty cylinders. See Illustration 10-2 for more information on compressed gas cylinders.

J. Store corrosive and toxic liquids in a cool, dry, well-ventilated, isolated place, with concrete floors treated to reduce solubility.

K. Segregate flammable materials or supplies from other items. Store flammable liquids, paints, oils, etc., in approved containers equipped with tight fitting closures. Use metal storage cabinets and safety containers for even small quantities of flammable liquids.

L. Provide good ventilation in buildings where flammable liquids are stored. Where mechanical ventilation, heating, lighting, or exhaust systems are necessary, install them in accordance with electrical and fire code requirements.

M. Prohibit smoking in areas in which flammable liquids are stored or handled. Post "No Smoking" signs in these areas. Be sure this rule is strictly observed. Don't store empty drums that have contained low-flash-point products (e.g., gasoline, acetone, alcohol, etc.) inside buildings.

10.6 Storage and Handling of Hazardous Materials

A. OSHA Standards

29 CFR Subpart H Hazardous Materials

29 CFR 1910.101 Compressed Gases (General Requirements)

29 CFR 1910.102 Acetylene

29 CFR 1910.103 Hydrogen

29 CFR 1910.104 Oxygen

29 CFR 1910.105 Nitrous Oxide

29 CFR 1910.106 Flammable and Combustible Liquids

29 CFR 1910.107 Spray Finishing Using Flammable and Combustible Liquids

29 CFR 1910.108 Dip Tanks Containing Flammable or Combustible Liquids

29 CFR 1910.109 Explosives and Blasting Agents

29 CFR 1910.110 Storage and Handling of Liquefied Petroleum Gases

29 CFR 1910.111 Storage and Handling of Anhydrous Ammonia

B. **Flammable and Combustible Liquids.** Flammable liquids are those that give off flammable or explosive vapors at or below 100°F (37.8C).

1. Flammable liquids (Class I) have a flash point below 100°F, such as:

   Gasoline 49
   Acetone 0
   Lacquer 0 to 80
   Shellac 40
   Ether 45
   Alcohol 52 to 91
   Varnish 80 or less
   Turpentine 95

2. Combustible liquids (Class II) that have flash points above 100°F and below 200°F include:

   Diesel Fuel 100
   Kerosene 150+
   Stoddard Solvent 100+
   Penetrating Oil 100+

3. Class III Liquids are those combustible liquids with flash points at or above 140°F, such as creosote oil, which is 165°F. See Illustration 10-3.

Illustration 10-2

THE SLEEPING GIANT

I AM A HIGH PRESSURE, COMPRESSED GAS CYLINDER

I stand 57 inches tall.

I am 9 inches in diameter.

I weigh in at 155 pounds when filled.

I am pressurized at 2,200 pounds per square inch (psi).

I have a wall thickness of about .25 inch.

I wear a regulator and hose when at work.

I wear a label to identify the gas I'm holding. My color is not the answer.

I transform miscellaneous stacks of material into glistening ships and many other things — when properly used.

I may transform glistening ships and many other things into miscellaneous stacks of material — when allowed to unleash my fury unchecked.

I can be ruthless and deadly in the hands of the careless or uninformed.

I am too frequently left standing alone on my small base without other visible means of support — my cap removed and lost by an unthinking workman.

I am ready to be toppled over — when my naked valve can be damaged or even snapped off — and all of my power unleashed through an opening no larger than a lead pencil.

I am proud of my capabilities — here are a few of them:

- I have on rare occasions been known to jetaway — faster than any dragster.
- I might smash my way through brick walls.
- I might even fly through the air.
- I may spin, ricochet, crash and slash through any thing in my path.

You can be my master only under these terms:

- Full or empty — see to it that my cap is on, straight and snug.
- Never — repeat — never leave me standing alone. Secure me so that I cannot fall.

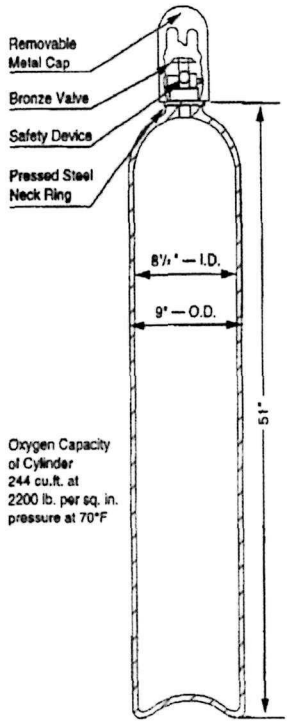
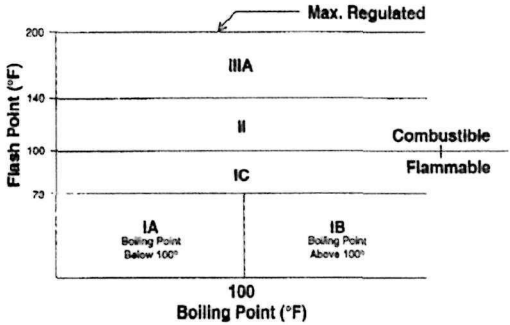


Illustration 10-3

Classes of Flammable and Combustible Liquids



TOPIC 11
MACHINES AND TOOLS

11.1 References

29 CFR 1910.211 Definitions

29 CFR 1910.212 General Requirements

29 CFR 1910.213 Woodworking Machinery Requirements

29 CFR 1910.215 Abrasive Wheel Machinery

29 CFR 1910.219 Mechanical Power-Transmission Apparatus

29 CFR 1910.241 Definitions

29 CFR 1910.242 Hand and Portable Powered Tools Equipment — General

29 CFR 1910.243 Guarding of Portable Power Tools

29 CFR 1910.244 Other Portable Tools and Equipment

29 CFR 1910.252 Welding, Cutting, and Brazing

29 CFR 1926.300 General Requirements

29 CFR 1926.301 Hand Tools

29 CFR 1926.302 Power-Operated Hand Tools

29 CFR 1926.303 Abrasive Wheels and Tools

29 CFR 1926.304 Woodworking Tools

29 CFR 1926.305 Jacks

29 CFR 1926.350 Gas Welding and Cutting

29 CFR 1926.351 Arc Welding and Cutting

29 CFR 1926.352 Fire Prevention

29 CFR 1926.353 Ventilation and Protection

29 CFR 1910.268 Telecommunications

11.2 **Procedures.** Machines and tools shall be properly maintained, operated, stored, and inspected.

11.3 **Portable Hand Tools**

A. **Chopping Tools (Axe, Pulaski, Hoedad, etc.)**

1. Use the right tool for the job. Keep it well sharpened with a splinter-free handle and a tight head.

2. Treat the ends of ax handles and other swinging tools to prevent slippage. Inspect wedges for tightness.

3. When swinging an ax or similar tool, place feet firmly and shoulder-width apart. Grip handle near the end. Make sure there is ample clearance from objects and persons near the swing arc. Always chop away from feet, legs, and body. Guard against loss of grip or control of tool if a glancing blow is struck against the target object.

4. Sheathe all chopping tools when not in use. Never leave an ax or similar tool in normal path of movement or sticking in a tree or stump.

5. Observe safe spacing between crew members carrying sharp or pointed tools. Travel on foot in single file. Sheathe tools and hand-carry on the downhill side, but do not carry on shoulder. Keep other hand free. If tripping, slipping, or falling, throw the tool to the downhill side. Use both hands to regain balance or break fall.

6. Be watchful of the force released by cutting a sapling that is being held in a bowed position by adjacent trees or brush.

7. Maintain 15-foot intervals between workers using tools.

8. Allow overhead clearance when using a brush-cutting tool. Use the proper handhold. Keep body well braced and balanced. Make each stroke productive.

B. **Chipping Tools.** Protect eyes from flying particles. Use screens to protect other persons from flying chips. Use tool holders when holding chisels or drills.

C. **Wrenches.** Place the wrench on the nut so that pull on the handle tends to force the jaws further onto the nut. Make sure you have a good footing before applying force to the wrench. Pull, don't push, the wrench when turning the nuts.

D. **Screwdrivers.** Never use a screwdriver as a chisel. Don't carry a screwdriver loose in pock ets. Use a screwdriver with an insulated handle and shaft for all electrical work.

E. **Hammers.** Select hammers with secure heads that are of suitable type, and weight, and have a proper handle length for the job to be done. Allow sufficient working space.

F. **Picks.** Use picks with handles that are free from splinters and securely fastened to the head. When swinging a pick, make sure that you have overhead and side clearance.

G. **Files.** Fit files with substantial handles and guards. Never use a file as a pry. Keep files clean to reduce slipping. Protect hands with proper gloves when filing sharp objects.

H. **Handsaws.** Keep handsaws properly sharpened. Use the thumb to guide the handsaw in starting a cut. Use teeth guards when carrying a crosscut or ripsaw.

I. **Air Tools**

1. Wear specified personal protective equipment (PPE) when operating air tools, such as earplugs, protective shoes, respirator, gloves, etc.

2. Do not use air tools unless a fixture on the tool retains the replaceable bit or jack set. Inspect retainers daily for cracks.

3. Air hose couplings must have safety chains to keep them from whipping loose if coupling fails.

4. Place line oilers so that oil cannot drain back into the air tank.

5. Release pressure before connections are broken; do not kink hose.

6. Make sure no one is in line of airflow. Never aim an air hose at anyone.

7. If the tool becomes detached from air hose under pressure, turn air off at the base control valve before air is turned on. Keep it closed until hammer is ready to use.

8. Never use pressurized air to blow dust or chips from hair or clothing.

J. **Chain saws.** Follow manufacturers' operating and safety instructions. Training and PPE are required for chain-saw operators. Required PPE for chain-saw operators are chaps, ear, eye, face, head, foot, and hand protection. Other required equipment includes wedges and a single-bit ax.

1. Stop and place the blade vertically before carrying a saw. The chain must be guarded. Carry saw on downhill side with blade to rear. Secure saw when transporting it in a vehicle.

2. Stop the engine and cool for about 5 minutes before refueling. Fill the fuel tank on bare ground. Wipe spilled fuel off the engine. Start saw at least 10 feet away from refueling area. Do not smoke while fueling or while saw is running.

3. Safe chain-saw starting techniques should be established and followed, always keeping the saw away from the body. Keep coworkers away from chain-saw starting and operation.

4. Stop engine for cleaning, adjustments, or repair.

5. Fuel tanks shall be purged prior to storage.

11.4 Portable Electric Tools

A. Inspect and test all power tools regularly and maintain in good condition. Establish a definite schedule for inspection, testing, maintenance, and repairs. All electric tools must be three-wire grounded, and fault-interrupter protected, or double-insulated.

B. Regularly test and maintain three-wire ground systems supplying electric power tools.

C. Use only electric cords and plugs in good condition. Make sure tool cords do not become tripping hazards. Protect tool cords against insulation damage during use. Unplug tools when not in use.

D. Do not operate power tools without training and authorization.

E. Do not operate portable electric tools where flammable vapors or gases are present or in wet areas.

F. All portable electric circular saws must have automatic guards that completely cover the cutting edges when saw is not in use. Do not use cracked, bent, dull, or damaged blades.

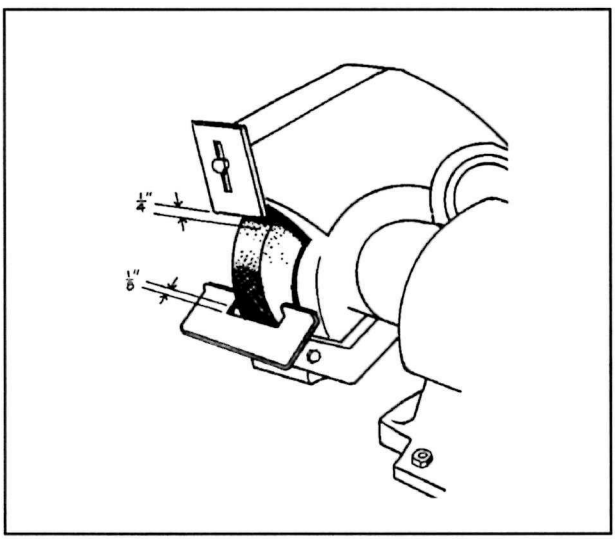
G. Drill-chuck wrenches must be eject type. Unplug the tool when changing bits or accessories. Anchor any material being drilled.

H. Keep portable grinder guards in place. Tool rest must be one-eighth inch away from stone; tongue guard must be one-fourth inch away (see Illustration 11-1).

I. Inspect motor-driven grinding stones at least weekly for cracks. Discard defective stones.

J. Keep stones free from oil and properly dressed.

Illustration 11-1



11.5 **Radio Equipment.** AC-powered radio equipment cabinets must be locked, and keys must be available only to specially instructed and authorized radio technicians or personnel.

A. Never use any radio or extend any antenna on a portable set if a lightning storm is within 1 mile.

B. Do not use radio transmitter within 300 feet of any electric blasting or any area where electric detonators are handled or stored.

C. Provide unextended whip antennas with safety knobs, closed loops, or other protective devices to prevent injury.

D. Only those qualified and trained may climb high structures. Wear appropriate PPE, such as safety belt, harness, etc., when climbing high structures. Do not work on energized antennas.

11.6 **Fixed Machines**

A. **Woodworking and Metalworking.** Only qualified and authorized personnel may operate shop equipment. Personnel must not wear loose clothing, ties, or jewelry, or have loose hair that may catch in moving machinery. Required PPE must be used.

1. Machines will be located to ensure adequate space for movement of the operator and handling of stock. Safety zones must be marked around each machine. Machine switches must be within immediate reach of the operator.

2. Floor and work areas must be kept free of sawdust, scrap, and excess material.

3. Machines designed for a fixed location shall be anchored.

4. Machines must be shut down and locked in accordance with lockout/tagout requirements before authorized and experienced persons make repairs only.

5. Machines that are operating must be attended at all times.

6. No machines may be operated unless required guards are in place and functional.

11.7 **Compressors.** All tanks must be in compliance with the American Society of Mechanical Engineers (ASME) standard and conform with state laws.

A. Make thorough monthly inspections for leaks and signs of corrosion on surfaces. Replace any worn parts and remove corrosion.

B. Don't replace the brass fusible plug with an ordinary pipe plug.

C. Clean or replace air filters as needed.

D. Make sure that all pressure tanks or lines have safety valves, air-pressure gauges, and a drain cock at the lowest point on the tank that is opened at least monthly to drain the condensation.

11.8 **Welding and Cutting.** Allow only qualified welders, mechanics, machinists, or specially qualified personnel to use welding equipment.

A. Welders shall wear appropriate PPE.

B. Confine welding activities to well-ventilated areas and away from flammable and combustible materials.

C. Keep sparks and flames away from cylinders and hose lines. All flammable or explosive material in the areas of welding operations must be removed.

D. Keep the correct type of fire-extinguishing equipment easily accessible at all times during welding operation.

E. Before cutting into tanks or drums, determine the present or previous contents. Drain, steam clean, and thoroughly dry if they held oil, gasoline, or other highly flammable fluids. Fill with water up to the point to be welded. Leave an opening for steam generated during welding to escape.

F. Use a respirator or point-of-operation exhaust ventilation when welding on metals coated with paint containing lead or zinc or when welding brass, because fumes from these metals are toxic. Adequate exhaust systems must be provided to ensure removal of injurious fumes and gases. If respirator is used, make sure that it is appropriately matched to the toxicity types and levels being generated, and that it meets all respiratory requirements.

G. Inspect hose lines and/or power cables frequently. Replace or repair damaged items.

H. Curtains or screens must be used around all welding locations.

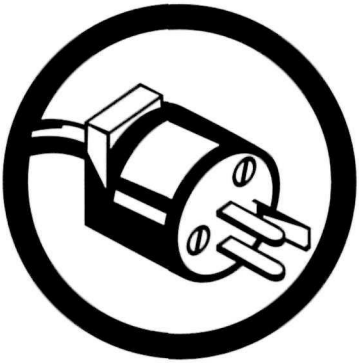
11.9 **Spray Painting.** Where spray-painting operations are regularly performed indoors, painting must be done in specially constructed, isolated, fire-resistant areas with approved electrical equipment. All motors, fixtures, switches, and electrical devices must be explosion proof. All sources of ignition must be eliminated, and spray booths are to be fitted with sprinkler heads in accordance with National Fire Protection Association requirements.

A. Only qualified and authorized personnel may operate painting equipment.

B. Painting areas must have adequate ventilation to remove flammable and toxic substances. Respirators must be worn when spray painting.

C. Smoking is expressly prohibited. A fire extinguisher of the correct type and size must be available.

D. All paint labeled flammable must be stored and mixed in an approved flammable liquid storage cabinet or flammable storage shed.



TOPIC 12

ELECTRICAL SYSTEMS AND EQUIPMENT

12.1 References

A. The National Electric Code

B. National Fire Protection Association (NFPA 70)

C. OSHA Standards — Subpart S — Electrical

29 CFR 1910.147 Control of Hazardous Energy (Lockout/Tagout)

29 CFR 1910.211 Definitions

29 CFR 1910.212 General Requirements

29 CFR 1910.213 Woodworking Machinery Requirements

29 CFR 1910.215 Abrasive Wheel Machinery

29 CFR 1910.219 Mechanical Power Transmission Apparatus

29 CFR 1910.241 Definitions

29 CFR 1910.242 Hand and Portable Powered Tools Equipment — General

29 CFR 1910.243 Guarding of Portable Power Tools

29 CFR 1910.244 Other Portable Tools and Equipment

29 CFR 1910.252 Welding, Cutting, and Brazing

29 CFR 1910.334 Use of Equipment

12.2 **Procedures.** Only trained and qualified personnel are to operate electrical devices in accordance with manufacturers' instructions applicable to the device. Supervisors are to ensure that all equipment (devices) identified as not meeting specifications contained in 29 CFR 1910 and the National Electric Code are properly tagged and removed from use.

12.3 **Inspections of Electrical Equipment.** Inspections of portable electrical devices shall be conducted prior to use and shall include: inspection of the service cord and plug; inspection of the case for cracks, corrosion, and loose or missing parts; inspection of on/off switches and "dead man" switches; inspection of guards over blades and rotating/reciprocating parts; and inspection of electrical filter assemblies.

12.4 **Other Electrical Appliances and Equipment.** Electrical appliances and equipment are defined as coffee pots, computer systems, fans, radios, clocks, typewriters, and other equipment not normally moved from one location to another. Only equipment listed by Underwriters Laboratories (UL) or other recognized certifying authority are allowed in the work space and shall be used only for their intended purpose. They shall be energized only through approved electrical outlets and power poles installed in accordance with the National Electric Code. Use of extension cords (flexible cords) for permanent installation of appliances and equipment, except as provided by the manufacturer as service cords, is prohibited. Use of electric space heaters is prohibited unless such heaters are equipped with tip-over safety switches and thermostat heat controls, and their use is authorized.

A. If using extension cords in a temporary situation (not to exceed 90 days per Uniform Building Code of authority having jurisdiction), observe these safe practices:

1. Disconnect by pulling the plug, not the cord.

2. Replace when worn, frayed, or brittle. Don't splice, kink, allow to overheat, or come in contact with chemicals.

3. Use cord to operate one appliance only. Don't use cords in lieu of fixed wiring, and do not run through openings, attach to building surface, or conceal in walls, ceilings, and floors.

4. Protect from physical damage, keep them from being run over by wheeled equipment, etc.

5. Extension cords shall be used only as allowed in 29 CFR 1910.305(g).

6. It is good management practice to test extension cords for proper wiring, impedance, and plug tension.

12.5 **Electrical Work at NPS Facilities.** All work, repair, or maintenance will be performed only by a licensed electrician.

12.6 **Electrical Safety.** (See 29 CFR 1910.301-399) Use only UL listed wire and apparatus and only as intended.

A. Ensure that breaker-box switches always indicate on the index the room, office number(s), and area or item where they control the electricity. Other markings indicating voltage, current, or wattage are required.

B. Treat all loose wires hanging from buildings or poles as "hot," unless certain they are not connected to a live source of electricity.

C. Exercise caution when installing or using fixed power equipment or portable power tools in hazardous or damp locations. Be careful when

using household appliances in kitchens, bathrooms, or basements, because of the proximity to ground sources such as water pipes.

D. Branch circuit receptacles should be tested periodically (annually) to ensure proper connection, low impedance, and tension.

E. De-energize switch before removing or replacing cartridge-type fuses.

F. Don't overload circuits. Where excessive use of appliances results in frequent fuse failure, redistribute plug-in appliances or install additional circuits. Don't change fuses to higher rating than wire size permits and do not use an alternate item as a fuse replacement.

12.7 **Electrical Equipment.** Keep electrical test equipment and hand tools in good repair. Restrict them to proper use.

A. Use only nonconducting ladders for electrical work. Keep ladders clean and free from dirt.

12.8 **Power Lines.** Treat all power lines as dangerous. Notify power company in advance concerning work on or near power lines or installations. Have the electrical utility perform work for which they are responsible, such as tree trimming or other maintenance activities.

12.9 **Lockout/Tagout.** This policy establishes the minimum requirements for the lockout of energy-isolating devices whenever maintenance or servicing is done. It ensures that the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing or maintenance, where the unexpected energization or startup of the machine, or release of stored energy, could cause injury. Authorized employees or contractors shall do servicing with these procedures followed at all

times. All employees, upon observing a machine or piece of equipment that is locked out for servicing or maintenance, shall not attempt to start, energize, or use that machine or equipment.

This policy does not apply to cord-and-plug-connected electric equipment where unexpected energization of the equipment is controlled by unplugging the equipment and under the exclusive control of the person performing the service or maintenance.

A. Sequence of Lockout System Procedure

1. Notify all affected employees that a lockout system is going to be utilized and the reason for this step. The authorized employee will know the type and magnitude of energy that the machine or equipment utilizes and will understand the hazards.

2. If the machine or equipment is operating, shut it down by the normal stopping procedure (i.e., depress stop button, open toggle switch, etc.).

3. Operate the switch, valve, or other energy isolation device(s) so that the equipment is isolated from its energy source(s). Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleed down, etc.

4. Lockout the energy-isolating devices with assigned individual locks with attached identification tags.

5. After ensuring that no personnel are exposed, and as a check to ensure that the energy sources are disconnected, operate the push button or other operating controls to make certain the equipment will not operate.

6. The equipment is now locked out.

B. **Restoring Equipment to Normal Operation**

1. After the servicing and/or maintenance is complete and equipment is ready for production, check the area around the machines or equipment to ensure that components are operational.

2. Check the work area to ensure that all employees have safely been positioned or removed from the area. Remove the lockout devices and tags, then re-energize the machine or equipment.

C. **Multiple Lockout Procedures**

1. If more than one individual is required to lock out equipment, each will place his/her own personal lockout device and identification tag on the energy isolating device(s). When an energy-isolating device cannot accept multiple locks, a multiple lockout device (hasp) must be used that allows the use of multiple locks to secure it. Each employee will use his/her own lock to secure the multiple lockout device complete with his or her identification tag.

2. When work is completed and each person no longer needs to maintain his or her lockout protection, that person will remove his/her lock and tag from the multiple lockout device. This is the only procedure to be used for multiple lockout.

D. Shift or Personnel Change

1. If a machine or piece of equipment must be locked out beyond the end of one shift, the supervisor of the shift going off duty must place his/her lock and tag on the machinery. Then all other employees who had locked the machine out may remove their locks and tags. The maintenance supervisor on the next shift will then place his or her lock and tag on the machine. When all employees who may be working on the machinery the next shift, have placed their locks and tags on the machine, the supervisor of the present shift may then remove his or her lock.

2. If a machine will be locked out for several shifts and no work will be done during that time, then a supervisor's lock must be left on the machine. In this case the importance of the identification tag is paramount.

E. Outside Contractors

1. When outside service personnel are engaged in service or maintenance activities that require energy control procedures, management and the outside contractor shall inform each other of their respective lockout procedures.

2. Management shall ensure that all employees understand and comply with the restrictions and prohibitions of the outside contractors' lockout procedures.

F. Glossary

Affected employee — An employee who performs the duty of his or her job in an area in which the energy control procedure is implemented and servicing or maintenance operations are performed. An affected employee does not perform servicing or maintenance on machines or equipment and is not responsible for implementing the energy control procedure. An affected employee becomes an "authorized" employee whenever he or she performs servicing or maintenance functions on machines or equipment that must be locked out.

Authorized employee — An employee who performs servicing or maintenance on machines and equipment. Lockout and tagout is used by these employees for their own protection.

Capable of being locked out — An energy isolating device is considered capable of being locked out if it meets one of the following requirements: (1) It is designed with a hasp to which a lock can be attached; (2) It is designed with any other integral part through which a lock can be affixed; (3) It has a locking mechanism built into it; or (4) It can be locked without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

Energized — Machines and equipment are energized when they are connected to an energy source or they contain residual or stored energy.

Energy-isolating device — Any mechanical device that physically prevents the transmission or release of energy. These include, but are not limited to, manually operated electrical circuit breakers, disconnect switches, line valves, and blocks.

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

Energy control procedure — A written document that contains those items of information an authorized employee needs to know in order to safely control hazardous energy during servicing or maintenance of machines or equipment.

Examples — Some common examples of machinery to be locked and tagged out while being worked on are table and reciprocal saws, drill presses, hydraulic lifts, grinders and cutters, presses, and electric motors.

TOPIC 13

WATERCRAFT OPERATIONS AND WATER SAFETY

13.1 References.

A. 33 CFR, Navigation and Navigable Waters, Subchapter S, "Boating Safety"

B. 46 CFR 2, Shipping, US Coast Guard, Dept. of Transportation, Requirements

C. 485 DM, Chapter 22, "Watercraft Safety"

D. 36 CFR, Part 3, Boating and Water Use Activities

13.2 Motorized Watercraft Procedures.

A. **Training and Certification.** All training and certification will be in accordance with 485 DM, Chapter 22.

1. Only NPS authorized employees who have successfully completed the Dept. of Interior Motorboat Operators Certification Course (MOCC) or other approved (i.e., Corps of Engineers Boat Operators Training Course and Federal Law Enforcement Training Center (FLETC) Marine Law Enforcement Program) shall operate Dept. of Interior watercraft under 65 feet, or under 300 tons.

2. Motorboat operator certification will be for a period of 5 years. Prior to being recertified, operators will complete an 8-hour refresher course.

3. Annually the operator will complete an inspection of the NPS vessel he/she operates and these inspections will be documented in writing (i.e., required equipment is on board, vessel is operational, emergency supplies are in place, etc.).

B. **Powered Watercraft Under 26 Feet in Length.**

1. Carry appropriate fire extinguishers for the types of fires that may be encountered on all powered watercraft.

2. Assure that adequate fuel is available for the mission. Carry spare gasoline in an approved safety can. Always shut off engine when refueling. All vessels should be kept topped off and in a response-ready state.

3. Except in emergencies, have only experienced operators make surf landings.

4. Equip watercraft with materials for patching holes, except those with center-filled flotation materials in sandwich-type construction. Craft that are used in areas where a reliable source of aid is more than 2 hours away should carry patching materials regardless of construction.

C. **Powered Watercraft Over 26 Feet in Length.**

1. Post safety regulations as required by the U.S. Coast Guard.

2. Assign only employees with a valid license for the class of craft and type of water being navigated as powered-watercraft operators.

3. Prepare and conspicuously post instructions for starting and operating main and auxiliary engines, anchor gear, radio, and other equipment so that in emergencies, someone other than the marine engineer can move the craft.

4. Personnel who regularly travel on boats must know how to start and operate the main and auxiliary engines, other gear, radio, etc., in case of emergency.

5. Standard safety equipment must include:

   a. Sufficient lifeboat capacity for all passengers. Lifeboats are equipped with outboard motors, oars and survival equipment.

   b. Readily accessible life preservers for all persons aboard in clearly marked locations. Sufficient life preservers or vests for rowboat or lifeboat use.

   c. One approved life ring on each side of pilot-house with at least 60 feet of buoyant line attached.

   d. Sufficient chain and proper anchor.

   e. Fire extinguishers for craft under 40 feet in length are required as follows:

      1. Gas powered – one 10 lb. BC rated;
      2. Diesel powered – one 4 lb. BC rated.

13.3 **Watercraft (manually operated).** All employees who utilize watercraft on a regular basis must be able to safely operate that particular craft alone.

A. Cargo should not exceed the rated capacity of the watercraft. Cargo should be secured to the craft to prevent shifting while underway. If cargo is required to be carried, balance the load evenly between port and starboard.

B. When possible, enter/leave the watercraft from the side, rather than the ends, and always step in the center of the craft. While moving about in a canoe or kayak, steady yourself by placing one hand on each gunnel.

C. Do not stand up, change places, or make sudden moves in the watercraft. Put in on shore if necessary to change places, repair motor, or reposition cargo.

D. Ensure anchor is attached to the bow. Exercise care in releasing and raising the anchor.

E. Metal and plastic craft should have skid-proof paint applied to the bottom of the craft.

F. Personnel at the bow are principal lookouts for submerged obstructions that can damage or capsize the craft. Direct operator accordingly.

G. Keep oars and oarlocks in good condition. Spare oars and oarlocks should be carried on long trips.

H. All transportation at night should be kept to a minimum. Appropriate lighting is mandatory.

I. Check with local residents when operating in unfamiliar rivers and lakes for water conditions that may be unique to that area.

13.4 Personal Protection in Watercraft.

A. Trained and experienced employees only may operate watercraft. Operators must be qualified to handle various sized craft as applicable.

B. Never overload a watercraft. Maintain a safe margin below the danger point. Post the maximum safe load limits on each vessel less than 26 feet in length.

C. Operator **MUST** be able to swim. Personnel who routinely travel by watercraft, or work on or near water, should be able to swim.

D. Have Coast Guard-approved life jacket readily accessible at all times for each person in a craft. Unless modified by means of a Job Hazard Analysis (JHA), and approved by the line supervisor, life jackets must be worn while operating all types of craft less than 26 feet in length.

E. Avoid traveling in small craft in heavy tidal currents.

F. Inspect rubberized craft or lifeboat seams, surfaces, fabric condition, valves, and ability to hold air under operating pressure before each use.

13.5 **Emergencies.** When involved in an overturned or sinking craft, surviving the incident is often dependent upon what you carry on your person.

A. Avoid traveling in high winds and rough water, or if a storm threatens. If caught in a storm, wear a life jacket, keep the bow to the sea or open water, and reduce speed. Beware of broaching. Kneeling on the bottom can lower a canoe's center of gravity.

B. If craft capsizes and you cannot get a life preserver, discard your heavy outer clothing and shoes (not applicable to colder climates/ conditions). Hang onto oars, boat or anything that will float until help arrives.

C. Do not attempt to swim to shore from an overturned or disabled craft. Stay with craft until it drifts, can be paddled, or help arrives.

D. Do not travel in a metal craft during lightning storms. If you sight an approaching storm, proceed to closest shore and beach the craft.

E. If you must continue (i.e., medical emergency) insulate yourself from the metal surfaces, i.e., sit on nonconductive materials.

F. First Aid equipment should be waterproofed and survival gear (for the environment) should always be aboard.

TOPIC 14
CONTRACTOR SAFETY AND HEALTH

14.1 References

A. Federal Acquisition Standards (FAR) 48 CFR, Chapter 1

B. Department of the Interior Acquisition Regulations (DIAR)

C. NPS Reference Manual 50B, Section 17

14.2 Procedures

A. **The Contracting Officer (CO) is responsible for, but may delegate these responsibilities to, the Contracting Officer's Representative (COR):**

1. **Advise of Potential Hazards.** NPS will provide information regarding hazardous substances to contractor employees as rerequired by OSHA 29 CFR 1910.1200 Hazard Communication Standard. The CO shall advise the contractor of all potential unsafe or unhealthful working conditions that have been determined to exist or have the potential to occur on the job site.

2. **Provide Material Safety Data Sheets (MSDS).** Provide Material Safety Data Sheets (MSDS) to the contractor for all hazardous materials provided by the Bureau for use by the contractor. If the contractor is to acquire, control, and use hazardous materials, the contractor is required to acquire MSDS for the hazardous products used.

B. The Contracting Officer's Representative (COR) is responsible for:

1. **Inspecting Work Site.** The COR shall inspect the work site or have a Project Inspector do so

at reasonable intervals to ensure that the contractor and the contractor's employees are complying with safety and health standards applicable to the workbeing performed.

14.3 **Contracts.** All contracts shall have Occupational Safety and Health clauses wherein the contractor is required to comply with all applicable safety and health standards as directed by Federal and/or state OSHA. The clause shall advise the contractor that failure to comply with safety and health standards shall result in a stop order being issued. All costs related to a stop order for failure to comply with safety and health standards will be borne by the contractor.

14.4 **Records**

A. All safety and health deficiencies noted during inspections will be recorded and maintained in the project contract files. Actions taken by the CO, COR, or Project Inspector to obtain compliance by the contractor shall be recorded and will be considered as limiting factors in future contract awards.

B. Accidents will be reported to the COR, as soon as possible, for investigation and reporting.

TOPIC 15
CONCESSIONAIRE SAFETY AND HEALTH

15.1 References

A. 29 CFR 1910 OSHA General Industry Standards

B. 29 CFR 1926, OSHA Construction Standards

C. 29 CFR 1910.1200 Hazard Communication

D. 43 CFR 2920.7 Terms and Conditions

15.2 **Procedures.** Any NPS office establishing contracts with concessionaires will include applicable safety and health requirements for protecting concession employees, the public, and Bureau personnel.

A. **Concessionaires' Safety Program.** The degree, scope, and complexity of the concessionaires' Safety Program will be determined by the products handled, the extent of equipment operations, and the amount of visitor services provided. Any program regardless of size should address the following concerns:

1. Procedures to identify and correct safety deficiencies.

2. Steps to ensure that safety awareness, hazard recognition, and accident prevention are being communicated to all affected groups.

3. Steps to ensure compliance with the Hazard Communication Standard.

4. Specific hazards directly associated with a particular concessionaire are identified in the Safety and Health Program.

5. Accident/incident and emergency procedures to be established and posted.

B. **Review of Concessionaires' Safety Program.** Offices, when appropriate, will monitor training, conduct and review safety inspections, and review safety promotion efforts conducted by concessionaires for the safety of their employees and the public.

TOPIC 16

INSPECTIONS AND ABATEMENTS

16.1 References

A. 29 CFR 1960 Subpart D Inspection and Abatement

B. 29 CFR 1960 Subpart H Training

C. 485 DM Chapter 6

D. NPS Reference Manual 50B, Section 4

16.2 Procedures

A. **Routine Inspections.** The routine inspection of all operations, workplaces, and facilities is a continuous part of every supervisor's responsibility.

16.3 **Formal Inspections.** Procedures for conducting formal inspections can be found in NPS Reference Manual 50B, Section 4.

A. **Annual Inspections.** Personnel sufficiently trained to recognize unsafe or unhealthful working conditions and occupational hazards shall conduct formal annual inspections of workplaces and facilities. Annual inspections should be scheduled with management at the facility to be inspected.

16.4 **Inspection Checklists.** Inspection checklists are an excellent tool for conducting routine inspections. While checklists are helpful, they are not all-encompassing. Hazards identified that are not included on checklists should be added as appropriate. The Appendix contains a sample inspection checklist.

16.5 **Supervisor Responsibility.** Supervisors are responsible for corrective actions on a continuing basis. Those corrective actions that cannot be implemented immediately by the supervisor will be referred to a higher level of management for corrective action.

TOPIC 17

EMPLOYEE REPORTS OF UNSAFE/UNHEALTHFUL WORKING CONDITIONS

17.1 References

A. 29 CFR 1960.26-28 Inspection and Abatement

B. 485 DM Chapter 8

C. Public Law 91-596, Section 8 (f)(1)

D. 29 CFR 1960.46 Agency Responsibility

E. 29 CFR 1960.8(a) General Duty Clause

F. NPS Director's Order 50B, Section 6

17.2 **Procedures.** Employees are responsible for identifying potentially hazardous conditions and correcting them when they have the ability and knowledge to do so.

A. **Supervisor Responsibilities.** Supervisors are the key to ensuring that employee reports of unsafe conditions are followed up. This responsibility cannot be delegated to the safety manager/coordinator or to the employee. Supervisors to whom reports are made are responsible for investigating employee reports and implementing controls to protect employees from the hazard. Examples of such controls are the following:

1. Discontinue the operation or process until corrective action is completed.

2. Remove all employees from the hazardous condition, operation, or process.

3. Place barriers and signs in the hazardous area to prevent employee entry until corrective actions are completed.

4. Provide employees with appropriate clothing or personal protective equipment (PPE) or tools to allow them to continue the task safely.

5. Advise employees concerning corrective actions completed or planned.

6. Forward the report to the safety manager, or to a higher authority if the safety manager does not have the expertise, authority, or resources to accomplish corrective action.

7. Follow up to ensure corrective actions have been taken.

B. **Safety Manager Responsibilities.** The safety manager is responsible for providing technical assistance to supervisors and managers for proper identification of hazards and appropriate corrective actions.

C. **Management Responsibilities.** Management officials are responsible for implementing and supporting the reporting process by doing the following:

1. Training employees in proper reporting of unsafe or unhealthful working conditions.

2. Providing supervisors with the resources to ensure that employees are protected from the potential hazard(s) reported.

3. Ensuring that no employee is subjected to restraint, interference, coercion, discrimination, or reprisal by virtue of submitting a report either orally or formally within the organization or to higher levels of authority.

17.3 **Employee Rights.** The employee has the right to decline a task because of a reasonable belief that there is an imminent risk of death or serious injury and there is insufficient time for hazard reporting and abatement actions. See 29 CFR 1960.46. Employees have the right to make reports and to remain anonymous without fear of reprisal.

17.4 **Reports to OSHA.** Employees may also submit formal complaints alleging workplace hazards directly to the Department of Labor (OSHA); however, the Secretary of Labor encourages employees to use the Bureau inhouse hazard-reporting procedure as the most expeditious means to achieve abatement. Complaints outside the Bureau may serve as the basis for investigations or inspections by OSHA officials; therefore, employees should not contemplate such actions until inhouse efforts prove to be ineffective.

17.5 **Workplace Violence.** Bureau offices shall implement a zero-tolerance policy on workplace violence. The policy shall be disseminated to all employees. Procedures for reporting workplace violence shall be established, and employees will be notified of the proper reporting procedure. Employees should receive training on prevention of workplace violence and proper reporting procedures.

TOPIC 18
CONFINED SPACE

18.1 References

A. 29 CFR 1910.146 Confined Space

B. Federal Cave Resources Protection Act 1988

C. 43 CFR Part 37 Cave Management Regulations

18.2 **Procedures.** Policy, procedures and standards must be developed for identifying permit-required confined space and associated hazards and controlling such hazards to allow safe entry. Safety standards consist of safety guidelines, job hazard analyses (JHAs), and search and rescue (SAR) procedures. Employees will have appropriate training prior to entry of such spaces.

18.3 Program Elements for Confined Space Entry

A. Identification of Confined Spaces

B. Hazard Identification/Risk Assessment

C. Hazard Control

D. Permit-System

E. Employee Information and Training

F. Site Control

G. Authorized and Unauthorized Entry

H. Equipment

I. Rescue

J. Protection from Internal Hazards

K. Duty to Other Employees

18.4 **Caving.** Cave management responsibilities include consideration for employee and public health and safety while in a cave. A safety orientation based on the following guidelines and JHAs is required for NPS employees who enter caves as a part of their duties.

A. **Program Elements**

1. Cave Safety Standards

2. Job Hazard Analyses

3. Search and Rescue Procedures/Pre-Planning

18.5 **Inactive/Abandoned Mines.** Confined space entry requirements have been expanded to include entry into inactive/abandoned mines. Due to the high potential of exposure to hazardous conditions during mine entry and examination, it is recommended that the entry requirements outlined under the Confined Space Policy be followed to ensure the safety of those employees required to enter mines to perform their duties. Pre-evaluation for hazards shall be done until it is determined that no hazardous conditions exist. Continuous monitoring for hazards (i.e., lower explosive limits, oxygen deficiency, toxic gases) is still recommended when in the mine. Use the JHA evaluation process for all entry situations.

TOPIC 19
OFF-ROAD VEHICLES

19.1 **References.**

A. 29 CFR 1910.132, General requirements

B. US Forest Service Health and Safety Code Handbook, Chapter 10

C. ATV Safety Institute, *http://home.att.net/~atvsafety/*

19.2 **All-Terrain Vehicles.** An all-terrain vehicle (ATV) is any motorized, off-highway vehicle 50 inches or less in width, having a dry weight of 600 pounds or less, traveling on three or more low pressure tires, and having a seat to be straddled by the operator and handlebars for steering control as defined by the ATV Safety Institute. For Department of Interior use, DOI employees will use only four-wheeled ATVs.

A. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using ATVs and the operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate ATVs. Qualifications include being trained by the supervisor for terrain and job to be completed and a thorough review of the ATV's manufacturer's operating manual.

3. Prior to use of the ATV, the supervisor shall conduct an evaluation to identify the profciency level of the operator.

4. Operators shall receive training in the use of and the loading/unloading of ATVs that includes classroom instruction and practical field exercise or demonstration of proficiency.

B. **Personal Protective Equipment.** Personal protective equipment (PPE) required for ATV use is as follows:

1. Motorcycle helmet. The helmet shall meet the requirements of the DOT, ANSI (Z90.1) or Snell Memorial Foundation standards.

2. Leather gloves

3. Long pants and long-sleeved shirt or jacket

4. Appropriate footwear

5. Eye protection (goggles or face shield)

C. **Other Required Equipment.**

1. Fire extinguisher

2. First aid kit

3. Personal communication device

4. Manufacturer's recommended tool kit

D. **Loading and hauling.**

1. Use a hauling vehicle of adequately rated capacity and capability. A tilt/bed trailer designed especially for ATVs is generally best for hauling ATVs.

2. Use loading ramps that are sufficiently wide and that secure firmly to the truck bed.

3. While transporting an ATV, put it in gear, set the parking brake, securely tie it to the hauling vehicle and close the tailgate.

E. **Operations.**

1. Become familiar with local hazards.

2. Before riding always perform a preride inspection (check owners manual for recommended). Otherwise check the following:

   a. Tires, Wheels

   b. Controls, Clutch, Brake, Throttle

   c. Lights

   d. Oil, Fuel

   e. Chassis, Suspension, Nuts, Bolts

3. Do not carry passengers.

4. Always turn off the engine when the ATV is parked. Remove the ignition key and set the brake.

5. When carrying equipment, equalize the load to maintain balance, stability and center of gravity. Never exceed the recommended gross vehicle weight.

6. Avoid driving on pavement.

7. Do not drive recklessly or engage in horse play.

8. Do not ford deep or swift moving water.

9. Modify an ATV only with the manufacturer's written approval.

19.3 Snowmobiles.

A. Qualifications.

1. The supervisor shall ensure that a Job Hazard Analysis (JHA), emergency evacuation procedures and communications plan are prepared and approved by the supervisor for all projects or activities using snowmobiles, and that operators possess the skills required for the work project or activity. An itinerary shall be filed with the supervisor and at the final destination when appropriate.

2. Only qualified and authorized employees shall operate snowmobiles. Qualifications include being trained by the supervisor for terrain and job to be completed, and a thorough review of the snowmobile manufacturer's operating manual.

3. Operators shall receive training in the use of and the loading/unloading of snowmobiles that includes classroom instruction and practical field exercise or demonstration of proficiency. Employees shall be trained in emergency survival, avalanche hazard recognition and, where needed, avalanche control.

B. **Personal Protective Equipment.** PPE required for snowmobile use is as follows:

1. Snowmobile helmet (DOT, ANSI or Snell approved).

2. Clothing adequate for winter travel, including goggles, gloves and boots.

3. Emergency equipment /clothing identified in the JHA.

C. **Other Required Equipment.**

1. Map and compass (a GPS receiver is optional)
2. Manufacture's operating manual
3. First aid kit
4. Flashlight with extra batteries and bulb
5. Shovel
6. Manufacturer's tool kit
7. Collapsible probes and avalanche rescue transceivers (if a possibility of avalanches exists)
8. Personal communication device
9. Skis or snow shoes
10. Sunscreen
11. Spare parts (nuts and bolts), rope, comealong, wire, wire-ties, flares, duct tape, electrical tape
12. Fire starter
13. Food and water, emergency food

D. **Operation.**

1. Always inspect the machine thoroughly before use, following procedures outlined in the manufacturer's operating manual.
2. Plan travel according to the weather and snow conditions. Be flexible with your departure dates.
3. Do not carry passengers.

4. Do not drive recklessly or engage in horse play.

5. Do not leave the engine running when parked. Turn it off, remove the ignition key and set the parking brake. If the machine does not have a parking brake, secure it against movement.

6. Avoid traveling at night and do not travel alone. If travel at night cannot be avoided, travel over familiar ground. Do not blaze a new trail. Reduce speed so you don't over drive the machine's headlights.

TOPIC 20
CONSTRUCTION AND MAINTENANCE

20.1 References.

A. 29 CFR 1926 (OSHA) Safety and Health Regulations for Construction

B. 29 CFR 1910 (OSHA) Occupational Safety and Health Standards

C. U.S. Department of Agriculture, Forest Service, Health and Safety Code Handbook, Chapter 30

20.2 General Procedures and Safety Practices.

"Construction work" refers to work projects and activities for general construction, maintenance, alteration or repair.

A. **Procedures.** The first line supervisor and employees shall prepare a job hazard analysis (JHA) and discuss it with ALL employees involved in the project before beginning any construction work projects or activities. JHA procedures include identification of tasks, potential hazards, and safe job practices/ procedures. Employees and supervisors should work together in the development of the JHA to assure that all characteristics of the job are addressed and that the safest and most efficient means of performing a job will be utilized. A JHA should be completed for:

1. Jobs or work practices that have potential hazards, or where injuries have occurred in the past.

2. New, non-routine, or hazardous tasks to be performed where potential hazards exist.

3. Jobs that may require employee to use of out-of-the-ordinary personal protective equipment (PPE).

4. Changes in equipment, work environment, conditions, practices, policies or materials.

5. Projects that involve interrelated work groups and mixed supervision, i.e., a Maintenance Division road crew performing work on a Natural Resource Division-supervised project.

B. **Safety Practices.**

1. Identify personnel on each project that have current First Aid/CPR training. Identify the location of the nearest First Aid Kit and fire extinguisher. Provide for adequate communications on all projects.

2. Check before proceeding with any construction work/project in buildings and facilities that all sources of potential lead or asbestos containing materials have been properly identified, and that this information has been communicated to all construction personnel and building occupants.

3. Obtain the material safety data sheets (MSDS) as required for any hazardous materials used and discuss with employees. Read and follow manufacturer's recommendations, including use of PPE, ventilation, preparation of surfaces and materials, application of materials and components, and use of flammables/ combustibles. Assure that a copy of the MSDS is retained on the construction work site.

4. Mark with signs and barricades all work that may be potentially hazardous to the public and employees in the area. Clean up and secure the area after each work shift.

5. Ensure construction adjacent to a highway or street is marked with signs and barricades that comply with required standards. Ensure personnel are properly equipped with reflective clothing/equipment and traffic control devices. Make sure construction is well lit when adjacent to roads with night time traffic.

6. Assure all electrical services, components, tools, etc., used on construction sites, are UL approved for outdoor use and are ground fault protected (GFCI).

20.3 Excavations.

A. **Procedures.** Conduct utility service (electrical, gas, sewer, water, telephone, cable, etc.) locates prior to excavations. Before excavation begins, a competent person shall inspect the site for conditions requiring special precautions. This is especially important in unstable soils and in the vicinity of roadways or utility structures. Conduct daily inspections of excavations, adjacent areas, and protective systems for evidence of potential hazards.

B. **Safety Practices.** Employees working in excavations shall be observed at all times by a trained competent person who is not in the excavation. Be aware of the following hazards:

1. Variable soil conditions and the effect of ground water. Inspect banks hourly or more if it rains or freezes.

   a. Comply with mandatory requirements that sides of excavations 5 feet or more in depth shall be shored, sheeted, braced, sloped, or otherwise supported by means of sufficient strength.

b. Locate a stairway, ladder, ramp, or other safe means of egress in trench excavations 4 feet or deeper, so employees have to travel laterally no more than 25 feet.

2. Working in and around the area of excavating equipment.

   a. Keep employees clear of all equipment working in the area.

   b. Where vehicles are required to back up to open pits, provide an 8-inch wheel stop and anchor it to a firm, stable and solid surface.

3. Maintain proper storage of excavation materials and equipment.

   a. Remove surface material that may fall into an excavation.

   b. Place excavation materials and equipment at least 2 feet from the edge of excavations, or use retaining devices or a combination of both methods if necessary.

4. Erect guardrails, barricades, or fences to prevent accidents and injuries.

   a. When employees or equipment are required to cross over excavations, provide walkways or bridges with standard guardrails.

   b. Provide physical barrier protection at all remote excavations.

5. Power lines in the work area. Do not touch loose or downed wires hanging from buildings or poles until it is certain that they are not "hot." Never assume any wire is deenergized. Treat all wires and guy wires as if they are hot.

20.4 Walking and Working Surfaces

A. **Procedures.** Prepare and discuss the JHA with employees. The JHA shall address all associated hazards pertaining to walking/working surfaces and corrective actions or abatements.

B. **Safety Practices.**

1. Use properly secured ladders, scaffolding, or lifts for activities above floor or ground level.

2. Provide the proper clearances in front of all electrical service panels and disconnects as required by the National Electrical Code.

3. Provide ample lighting and ensure that ingress/egress are available at all times.

4. Keep workrooms and storerooms clean and orderly and free of tripping hazards. Keep aisles and passageways clear of materials and well lit for safe access by employees and equipment. Clearly mark permanent aisles and passageways.

5. Wipe up spills immediately. Never leave wet floors unmarked and unattended.

6. Maintain drainage in areas where wet processes are used. If a dry standing workstation cannot be provided, supply appropriate waterproof footwear and/or floor coverings.

20.5 Guarding Openings.

A. **Procedures.** The JHA shall address hazards associated with guarding floor openings and excavations.

B. **Safety Practices.**

1. Guard every wall and floor opening from which there is a drop of more than four feet with a standard railing, toeboard or equivalent barrier.

2. Equip flights of stairs with four or more risers with hand railings. Consider flights with less than four risers on a case-by-case basis.

3. Provide covers and/or guardrails to protect employees from open pits, tanks, vats, and ditches.

4. When excavations or unguarded openings must be left between work shifts, fence them off with standard construction fencing.

20.6 Ladders.

A. **Procedures.** The proper use of ladders can prevent a serious accident. Accident analysis reveals the following four principle causes of ladder accidents:

1. Ascending or descending improperly.

2. Failing to secure the ladder at the top, bottom, or both.

3. Holding objects while ascending or descending.

4. Structural failing of the ladder.

B. **Safety Practices.** Ladders are for temporary use only. Replace ladders with stairways, proper guardrails, and landings whenever possible.

1. Select a ladder that meets applicable OSHA/ANSI standards and is right for the job.

2. Inspect ladders for defects before use each day, and after any occurrence that could damage the ladder. Inspect and test any ladder that has been accidentally dropped, exposed to heat or otherwise damaged.

3. Defective ladders must be withdrawn from service for repair or destruction and marked as **"DANGEROUS, DO NOT USE."**

4. Wood ladders must not have cracked rungs or split rails, must be free of splinters, and must have smooth edges.

5. Metal ladders are electrical conductors and shall not be used around electrical circuits or for electrical arc welding operations.

6. Avoid dangerous overreaching. Move the ladder to a new location when you must lean more than one foot to the side.

7. Never "walk" a ladder while standing on it.

8. Set the ladder on firm, level ground. Use nonskid ladder feet for added safety, especially when working on ice or snow.

9. When using stepladders, ensure that the ladder is fully opened and locked with the pail shelf in position.

10. When using extension ladders, make sure ladder extension locks work correctly, and that the rope and other accessories are properly affixed and in good condition.

11. **NEVER** step, stand or sit on the ladder top, braces, or back section.

12. **NEVER** straddle the top or stand on the top two steps of ladders.

13. Ensure that ladder feet are firmly supported. Have a person on the ground firmly hold the ladder to prevent slipping or secure a board to the floor against which the foot of the ladder can rest.

14. Always face the ladder when ascending or descending; use both hands.

15. Protect ladders from inclement weather. Store them in a dry place, away from excessive heat and possible physical damage.

16. Store ladders vertically. Wooden ladders stored horizontally should be supported at both ends and in the middle to prevent sagging.

20. 7 **Fall Protection–Body Harnesses, Lifelines, and Lanyards.** A personal fall arrest system is used to arrest a person in the event of a fall from a working level. The system consists of an anchorage, connectors, and a body harness, and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

A. **General.**

1. Provide employees with personal fall arrest systems, safety net systems, or guardrail systems as standard fall protection when working 6 feet or more above lower levels, moving machinery, or when working over water. Also use this equipment on steep slopes or other areas as warranted. Select the system that best suits the particular work situation.

2. Provide safety net systems when work places are more than 25 feet above the ground, water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines or body harnesses is impractical.

B. **Personal Fall Arrest Systems.**

1. Thorough employee training in the selection and use of personal fall arrest systems is imperative. Careless or improper use of the equipment can result in serious injury or death.

2. Inspect personal fall arrest system components prior to each use for wear, damage, and other deterioration. Defective componnents shall be removed from service and destroyed.

3. Personal fall arrest system components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.

C. **Safety Ropes.**

1. Inspect safety ropes before and after every use and carefully store them. Check ropes daily during periods of use for broken fibers. To check, twist the strands back, and immdiately destroy any rope that shows signs of damage or wear.

2. Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum of 5,400 pounds.

3. Lifelines used for rock scaling operations or in areas where the lifeline may be subject to cutting or abrasion shall be a minimum, of 7/8-inch wire core manila rope. For all other lifeline applications a minimum of 3/4-inch wire core manila rope or equivalent, with a minimum breaking strength of 5,400 pounds shall be used.

D. **Safety nets.**

1. Must extend 8 feet beyond the edge of the work.

2. Are never lower than 25 feet below the level of the work.

3. Are hung to prevent the user's contact with surface below.

4. Are impact-load tested before use.

20. 8 Scaffolding.

A. **Procedures.** Scaffolds and supports shall be designed by a structural engineer. The structural engineer shall also prepare the work plan. Complete a JHA and discuss it with all employees before using the scaffolding.

B. **Safety Practices.**

1. Ensure that a competent person supervises the building, installation, moving, dismantling and alteration of any scaffold.

2. Have an engineer or other designated, competent person inspect all scaffolds before each workday. Do not allow a scaffold built by one crew to be used by another crew until it has been inspected and pronounced safe by a competent person.

3. Prohibit the use of shore or lean-to scaffolds. A shore scaffold is defined as a supported scaffold which is placed against a building or structure and held in place with props; a lean-to scaffold is defined as a supported scaffold which is kept erect by tilting it toward and resting it against a building or structure.

4. Prohibit work on scaffolds during storms or high winds.

5. Install guardrails and toeboards at all open sides on all scaffolds more than 10 feet above the ground or floor, except needle beam scaffolds and floats.

6. Where persons are required to work or pass under the scaffold, provide a screen, consisting of no. 18 gauge U.S. Standard wire, 1/2 inch mesh or equivalent, between the toeboard and the guardrail that extends along the entire opening.

TOPIC 21

GROUNDS MAINTENANCE

21.1 **References.**

A. 29 CFR Parts 1910 and 1926

B. US Forest Service Health and Safety Code Handbook, Chapter 22

C. ANSI Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection

D. ANSI Z 133.1-1994, Tree Care Operations

21.2 **Chain Saw.** A gasoline or electric powered machine with a special sharpened chain for cutting trees, brush and other wood items. This description includes pole mounted chain saws. Chain saw operations include, but are not limited to, felling, bucking, limbing and specialized uses.

A. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using a chain saw and that operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate a chain saw. Qualifications include being trained by the supervisor for the job to be completed and a thorough review of the manufacturer's operating manual.

3. Prior to use of the chain saw, the supervisor shall conduct an evaluation to identify the proficiency level of the operator.

4. Operators shall receive training in the use of a chain saw that includes classroom instruction and practical field exercise or demonstration of proficiency.

5. Follow the manufacturer's safety, operation and maintenance recommendations for the specific chain saw to be used.

B. **Personal Protective Equipment.**

1. PPE required for chain saw operators are chaps, ear, eye, face, head, foot and hand protection.

2. Wear snug-fitting clothing. **DO NOT** wear scarves, jewelry or neckties.

C. ***Other Required Equipment.***

1. Fire extinguisher

2. First Aid kit

D. **Operation.**

1. Always carry the chain saw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.

2. It is recommended that a chain saw be operated only when 2 people are present—never alone.

3. Starting/Operating saw. The following basic precautions generally apply, regardless of the saw model:

   a. Maintain a secure grip on the saw with both hands at all times.

   b. Always start the saw with the chain brake engaged.

c. Start the saw on the ground or where otherwise firmly supported. **DO NOT** "drop start" a chain saw. Make sure the saw chain is not contacting anything before starting.

d. Be sure the area in which you are cutting is free from obstructions.

e. In general, throttle up to full speed before letting the chain contact the wood.

f. In general, do not throttle down before the cut has been completed.

g. Avoid cutting with the power head positioned between the waist and shoulders, which is considered a danger zone.

4. **DO NOT cut with the power head positioned above shoulder height** (do not overreach or cut above shoulder height).

5. Fueling Saw.

   a. Allow the saw to cool at least 5 minutes before refueling. Fill the tank on bare ground or other noncombustible surface.

   b. Refuel outdoors and at least 20 feet from an open flame or other sources of ignition.

   c. Start the saw at least 10 feet from the fueling area.

6. Felling, Bucking and Limbing Techniques

   a. The project supervisor and the sawyer shall determine jointly if spotters are needed during tree felling operations.

b. **No employee shall approach a faller closer than 2 1/2 tree lengths of trees being felled until the faller has acknowledged that it is safe to do so, unless it is demonstrated that a team of employees is necessary to manually fell a particular tree.**

c. **Escape Paths.** Before felling or bucking any tree or snag, always provide for escape in emergencies. Establish firm footing.

1. Never start cutting until you have a clear work area.

2. Determine the lean of the tree. Recheck the primary and secondary escape routes and alternates.

3. As the tree lift begins, check the direction the tree is falling. Proceed along the predetermined escape path to your safety zone. Keep alert for falling debris and kickback.

d. When cutting a limb that is under tension, be alert for spring-back so that you will not be struck when the tension is released.

e. Ensure that adequate traffic control measures are taken, such as signs, cones, barricades, vehicles or personnel when felling or working across or alongside any traveled route.

7. **Bucking, Brushing, and Limbing.**

a. Never buck a tree that is considered unusually dangerous.

b. Consider bucking hazards, including overhead hazards. Anticipate the log's reaction when it is severed. When trees on sloping ground are bucked, use blocking devices that prevent bucked sections from rolling or sliding. Always work from uphill side.

c. Anticipate the log's reaction when it is severed.

d. Beware of other logs, branches or rocks immediately behind the area where you are bucking, brushing or limbing for possible kickback potential or rocking of the chain.

e. Remember that touching any object with the tip of the chain and bar can cause a kickback.

f. Know where the tip of the bar is at all times.

g. Remove limbs and brush before bucking.

h. When topping, brushing or limbing, be cautious about any tree held off the ground by its branches.

i. Do not cut limbs or branches that support the tree off the ground.

j. Walk on top of large downed logs while limbing (if possible) to prevent a log from rolling onto the operator.

k. Be aware of side, top, bottom and internal bind due to natural unevenness of the ground and objects, such as stumps, windfalls and rocks. Initiate bucking slowly. Observe kerf closely to determine the bind.

l. Cut a sapling or branch that is bound down only when it is necessary for safety. Make a series of small cuts on the decompressed side of the sapling or branch to release the bind.

m. Completely saw off log chunks.

n. Buck windfalls only after examining each tree to be cut for strains, breaks, binds, and the chance of root wads falling, rolling or setting upright when the weight of the tree is removed. Be aware of trees that are underneath the one you are bucking as they may be under pressure and could move in any direction when the overhead weight is cut or removed.

21.3 **Mower.** A gasoline or electric powered machine with rotary blades, reels, or flails used to cut turf grass, weeds, and other succulent growth. This includes push, self-propelled and riding mowers.

A. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using mowers and the operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate a mower. Qualifications include being trained by the supervisor for the job to be completed and a thorough review of the manufacturer's operating manual.

3. Prior to use of the mower, the supervisor shall conduct an evaluation to identify the proficiency level of the operator.

4. Operators shall receive training in the use of a mower that includes classroom instruction and practical field exercise or demonstration of proficiency. Operator must be skilled and trained in how to drive on hillsides before mowing slopes.

B. **Personal Protective Equipment.**

1. PPE required for mower operators are ear, eye, foot and hand protection.

2. Always wear long pants. **DO NOT** wear loose fitting clothing.

3. A hard hat is advisable.

C. **Other Required Equipment.**

1. Fire extinguisher

2. First Aid kit

D. **Loading and hauling.**

1. Use a hauling vehicle of adequately rated capacity and capability.

2. Use loading ramps or hydraulic lift gates, that are sufficiently wide and that secure firmly to the truck bed.

3. While transporting a mower, put it in gear, set the parking brake, securely tie it to the hauling vehicle and close the tailgate.

E. **Operation.**

1. Check area to be mowed and remove all debris and other objects that might be picked up and thrown by cutter blades or other fast moving components from other attached implements.

2. Check the fuel and lubricant levels and fill while engine is cool.

3. Thoroughly inspect the mower and tighten loose bolts, nuts and linkage at the beginning of the day. Ensure that mower blades are sharp.

4. Ensure that all guards/shields and safety devices are kept in place, are secure and operating properly.

5. When operating a machine with ROPS (Roll-Over Protection System) always use seat belt and make sure seat pivot retaining pin is installed.

6. Keep the area clear of bystanders, children and pets.

7. Plan the cutting operation so it is not necessary to pull the mower rearward towards you, particularly on a downgrade.

8. Mow across the face of slopes, never up and down. Exercise extreme caution when changing direction on slopes.

9. Check carefully for overhead clearances such as branches, doorways, electrical wires, before driving under any objects and do not contact them.

10. Do not rely entirely on safety switches; on riding mowers, shut off engine before getting off seat.

11. Shut off engine (motor) and make certain the blade and all moving parts have stopped whenever you leave the machine and when making any adjustments, repairs, inspections or cleaning the mower.

12. Do not leave running engine (motor) unattended.

21.4 **String Trimmer.** A gasoline or electric powered machine, hand carried, with a drive extension connected to a trimmer head using plastic or nylon string to cut vegetation at ground level.

A. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using a string trimmer and the operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate a string trimmer. Qualifications include being trained by the supervisor for the job to be completed and a thorough review of the manufacturer's operating manual.

3. Prior to use of the line trimmer, the supervisor shall conduct an evaluation to identify the proficiency level of the operator.

4. Operators shall receive training in the use of a string trimmer that includes classroom instruction and practical field exercise or demonstration of proficiency

B. **Personal Protective Equipment.**

1. Eye, ear, hand, foot, and leg protection is required. Wear snug fitting, durable clothing, i.e., pants with long legs and long-sleeved shirts.

C. **Other Required Equipment.**

1. First Aid kit.

D. **Operation.**

1. Thoroughly inspect the line trimmer and tighten loose bolts, nuts and linkage at the beginning of the day. Ensure that all guards/ shields and safety devices are in place, secure and operating properly.

2. Start unit on ground, not in operating position, by holding unit firmly down with one hand while cranking engine with other.

3. Do not raise the cutting head above knee height. Trimmer head should be kept at the same elevation as the feet.

4. Check area to be trimmed and remove objects trimmer could throw.

5. Keep the area clear of bystanders, children and pets. Do not allow anyone to enter the operating **DANGER ZONE,** a distance of 50 feet in radius (about 16 paces).

6. Keep a firm grip with both hands on handles.

7. Maintain a solid stance with firm footing and balance at all times.

21.5 **Stump Grinder.** A Stump Grinder is any machine used to cut, grind or otherwise reduce tree stumps and roots to small chips.

A. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using a stump grinder and the operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate a stump grinder. Qualifications include being trained by the supervisor for the job to be completed and a thorough review of the manufacturer's operating manual.

3. Prior to use of the stump grinder, the super visor shall conduct an evaluation to identify the proficiency level of the operator.

4. Operators shall receive training in the use of and the hitching/unhitching of stump grinder that includes classroom instruction and practical field exercise or demonstration of proficiency.

B. **Personal Protective Equipment.**

1. PPE required for stump grinder operators are ear, eye, face, head, foot and hand protection.

2. Always wear long pants. **DO NOT** wear loose fitting clothing.

C. **Operation.**

1. Thoroughly inspect the stump grinder and tighten loose bolts, nuts and linkage at the beginning of the day.

2. Make sure stump grinder is properly attached to the towing vehicle before moving and that it is secure for operation. Safety chains should be secured to tow the vehicle at all times.

3. Ensure that all guards and safety devices are in place, secure and operating properly.

4. Before operating stump grinder, check area and remove any foreign debris or objects that may be on or adjacent to stump to be ground.

5. Avoid underground utilities and always connect a ground cable from the stump grinder to a metal stake driven into damp earth.

6. Stand behind shields or guards on the machine, never in front of grinder.

7. Keep the area clear of bystanders, children and pets.

8. If stump grinder is disconnected from the towing vehicle for operation, ensure that all legs are fully extended and that the wheels are blocked before operation.

9. Shut off engine (motor) and make certain the blade and all moving parts have stopped before leaving the operators position/controls.

21.6 **Wood Chipper.** A Wood Chipper is any machine used to cut, grind or otherwise reduce wood from tree trunks, branches, leaves and roots to small chips.

A. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using a wood chipper and the operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate a wood chipper. Qualifications include being trained by the supervisor for the job to be performed and a thorough review of the manufacturer's operating manual.

3. Prior to use of the chipper, the supervisor shall conduct an evaluation to identify the proficiency level of the operator.

4. Operators shall receive training in the use of and the hitching/unhitching of the chipper that includes classroom instruction and practical field exercise or demonstration of proficiency.

B. **Personal Protective Equipment.**

1. PPE required for chipper operators are chaps, ear, eye, face, head, foot and hand protection.

2. Always wear long pants. DO NOT wear loose fitting clothing

C. **Other Required Equipment.**

1. A chain saw.

2. First Aid Kit.

D. **Operation.**

1. Thoroughly inspect the chipper and tighten loose bolts, nuts and linkage at the beginning of the day. Ensure that all guards and safety devices are in place, secure and operating properly.

2. Before operating chipper, check feed chute and remove any foreign debris or anything that may have been put into the machine openings while it was unattended.

3. Approach chipper from the side when in operation. Never approach the chipper from the direction the discharge chute is pointed.

4. Never look into or reach into the feed chute. Do not stand on or put feet into chute.

5. If chipper is disconnected from the towing vehicle for operation, ensure that all legs are fully extended and that the wheels are blocked before operation.

6. Allow only one person at a time to feed the chipper, and always feed the material from the side by inserting material butt end first into the hopper.

7. Feed short pieces into the hopper with a long push stick and use the push stick or another limb to clear the hopper. Dislodge limbs and debris that hang up in the conveyor mechanism in the same manner.

8. Check material being fed into chipper for embedded rocks or other foreign objects before the material is put into the hopper.

9. Ensure that the material discharge area is clear before starting the blower.

10. The operator should ensure that the disc cover is closed and the manufacturer's disc cover pin is in place and locked before starting the engine or operating the chipper.

11. Maintain all safety decals and ensure that missing or damaged decals are replaced.

21.7 **Carryall II Plus, Industrial Golf Carts, Service Carts, Electric Trucks and related vehicles.** Carryall II Plus, Industrial Golf Carts, Service Carts, Electric Trucks, and related vehicles are used for a wide variety of tasks in park operations. These trucks are also used in a variety of small-scale industrial operations because they are very easy to operate. These vehicles should not be operated on public highways, as they are typically not designed to comply with any Department of Transportation requirements. (See exceptions below.)

A. **Classification of vehicles**

1. The NTSB classifies four-wheel vehicles with a top speed of 20-25 mph as "low speed vehicles." These vehicles, such as Carryall's and electric trucks, can reach a speed of 20-25 mph or may fall under the Federal Motor Vehicle Safety standards and must have proper equipment similar to cars, i.e. lights, turn signals, seatbelts, etc. Operators of these vehicles must have a valid state license.

2. Industrial Golf Carts have a speed of less than 20 mph and are not classified as "low speed vehicles." However, operators must be 18 years or older to operate them. The maximum speed in most cases is 15 mph and most carts used are gasoline-powered. They have brake lights

but no signal lights and these carts do not meet the Department of Transportation Motor Vehicle safety standards. This vehicle is not equipped with seatbelts and is not designed with roll over protection. The top and windshield do not provide protection from falling or flying objects.

B. **Qualifications.**

1. The supervisor shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using small industrial carts, and the operators possess the skills required for the work project or activity.

2. Only qualified and authorized employees shall operate a small industrial cart. Qualifications include being trained by the supervisor in the use and operation of the vehicles. Operators must be 18 years or older to operate these vehicles. An experienced driver should accompany each firsttime driver on a test drive before allowing him/her to operate the vehicle alone.

C. **Operation.**

1. Operators are responsible for following the manufacturer instructions on operation of vehicles.

2. Vehicle should only be operated from driver's side and not more than two occupants in the vehicle at one time. Be sure passenger is fully seated before moving vehicle.

3. Do not allow passengers in cargo bed.The vehicle is not equipped for handicapped persons. Be sure all passengers are capable of securing themselves in vehicle before allowing them to ride in one.

4. Bring vehicle to a complete stop before exiting vehicle. To prevent serious injury, keep your entire body (including hands, head, legs and feet) inside the vehicle when vehicle is in motion.

5. **DO NOT** drive vehicle on steep slopes. To prevent overturning of vehicle, drive slowly straight up and down slopes.

6. Use caution when backing or on grades or slippery surfaces.

7. Drivers should keep both hands on the steering wheel when operating the vehicle and wear seatbelt with vehicles that are so equipped.

8. Remove key when cart is not in use. Apply park brake.

9. During inclement weather, seek appropriate shelter especially during lightning or storms, as carts do not provide appropriate protection.

10. Avoid driving downhill as a sudden stop or change of direction could result in loss of control. Likewise reduce speed for adverse driving conditions such as wet grass or rough terrain.

11. Vehicles should not be used on public roads other than when in a park setting and if necessary, cross the streets in the curb cuts at the cross walks using pedestrian cross signals.

12. If vehicle is unable to climb a hill DO NOT attempt to turn it around. Turning vehicle sideways on a hill could result in vehicle rolling over. Slowly back down hill using service brake to control speed.

13. Stop vehicle before shifting forward and into reverse. Failure to do so could result in injury to passengers or damage to vehicle.

D. Loading and Unloading

1. Firmly engage park brake before loading the vehicle.

2. Do not allow people in the cargo bed.

3. Do not exceed the rated capacity of the vehicle. Overloading can effect vehicle handling or cause component failure, resulting in loss of control of vehicle or personal injury.

4. Reduce vehicle load and speed when driving up or down slopes or uneven terrain. Rated load capacity is for level surfaces only.

5. Make sure cargo is well secured. Avoid top heavy loads.

6. Do not load the tailgate. Tailgate should be in upright position and securely latched when vehicle is in motion.

E. Maintenance

1. All industrial carts must be maintained in good operating condition.

2. A checklist must be maintained on each cart and completed each day to verify that maintenance was provided. Operating instructions should be prominently displayed on each vehicle.

3. Do not allow smoking near battery charging area. Post 'no smoking" signs.

4. Make sure there is good ventilation in charging area.

5. Remove jewelry when inspecting or cleaning battery, i.e. rings, wristwatches, chains, etc., wear a face shield and safety goggles to avoid getting acid in eyes. Do not let acid contact the skin. Wear acid resistant gloves.

6. Wash hands immediately after the job.

7. Make sure battery vent tops are clean. Keep top of battery clean using a baking soda mixture.

CARTS ARE EASY TO USE BUT VULNERABLE TO TIP-OVER. TAKE TIME TO OPERATE THEM SAFELY.

APPENDIX
FACILITIES SAFETY INSPECTION CHECK LIST

OK	ACTION NEEDED		
			GENERAL
( )	( )	1.	Is the required OSHA workplace poster prominently displayed?
( )	( )	2.	Has the office head demonstrated an active interest in safety and health matters by defining a policy for the workplace and communicating it to all employees?
( )	( )	3.	Are the required forms, Report of Accident/Incident, prepared for all employee and visitor accidents/incidents and promptly forwarded to the safety manager?
( )	( )	4.	Has the safety coordinator/manager received the required training?
( )	( )	5.	Is there an active safety committee or group that allows and encourages participation of employees in safety and health activities?
( )	( )	6.	Does the safety committee or group meet regularly and prepare written reports of its activities? Are copies of the minutes promptly sent to the safety manager?
( )	( )	7.	Is there an established procedure for handling employee concerns regarding safety and health issues without fear of reprisal?
( )	( )	8.	Are workplace emergency plans current? Do they cover all types of natural disasters that might be anticipated to affect the work place?

( ) ( ) 9. Are emergency telephone numbers posted where they can be easily seen in the event of an emergency?

( ) ( ) 10. Are the workplace emergency plans readily available for quick reference during working hours?

( ) ( ) 11. Are the workplace emergency plans readily available for quick reference before and after working hours and on weekends? Are appropriate after-hours telephone numbers included in the emergency plans?

( ) ( ) 12. Does the workplace emergency plan list the name and extension of employees currently certified in CPR and first aid?

( ) ( ) 13. Have copies of the current emergency work place plans been sent to the safety manager?

( ) ( ) 14. Have all employees who drive either a Government vehicle or a private or rental vehicle on Government business attended a defensive driving course within the last three years? Has the training been documented? Are employees notified of the need for defensive driving refresher training at least six months before their defensive driving certificate expires? Do the employees have valid state driver licenses?

( ) ( ) 15. Have all aircraft users had a minimum of eight hours of aviation safety training within the last three years? Has the training been documented?

( ) ( ) 16. Have all employees who operate all-terrain vehicles or other large or unique vehicles been properly trained in the operation of

such vehicles? Has the training been documented? When appropriate, do the employees have valid state driver's licenses to operate such vehicles?

( ) ( ) 17. Have appropriate employees been trained in CPR and first aid? Has the training been documented? Are employees notified of available refresher training before their CPR and/or first-aid certificates expire?

( ) ( ) 18. Has other suitable safety and health training been provided for appropriate employees? Has such training been documented?

ELECTRICAL WIRING, FIXTURES, AND CONTROLS
29 CFR 1910.301

( ) ( ) 1. Are fuses and circuit breakers the right type and size for the load on each circuit?

( ) ( ) 2. Are all fuses free of "jumping" with pennies or metal strips?

( ) ( ) 3. Are all switches properly identified to show their purpose?

( ) ( ) 4. Do switches or circuit breakers show evidence of overheating?

( ) ( ) 5. Are switches mounted in clean, tightly closed metal boxes?

( ) ( ) 6. Are all outlets covered by face plates?

( ) ( ) 7. Are all plugs safe to use?

( ) ( ) 8. Are metallic cable and conduit systems properly grounded?

( ) ( ) 9. Are outlets tested for proper grounding?

( ) ( ) 10. Are ground-fault circuit interrupter outlets provided in restrooms or at other locations within six feet of a water source?

( ) ( ) 11. Are portable electric tools and appliances grounded or double-insulated?

( ) ( ) 12. Is any cord temporarily placed in a walkway covered by a runner?

( ) ( ) 13. Are all electrical cords three-pronged and free from fraying or other defects?

( ) ( ) 14. Are all telephone cords and any temporary extension cords secured under desks or alongside baseboards?

( ) ( ) 15. Do all electrical installations in locations classified as hazardous — due to the possible presence of flammable vapors, liquids or gasses, or combustible dusts or fibers — meet the OSHA requirements of 29 CFR 1910.307 for such locations?

( ) ( ) 16. Are electric motors clean and kept free of excessive grease and oil?

( ) ( ) 17. Are electric motors properly maintained and provided with adequate over-current protection?

( ) ( ) 18. Are portable lights equipped with proper guards?

( ) ( ) 19. Are all lamps kept free of combustible material?

EXITS AND ACCESS
29 CFR 1910.35

( ) ( ) 1. Are all exits visible and unobstructed?

( ) ( ) 2. Are all exits marked with a readily visible sign that is properly illuminated?

( ) ( ) 3. Are there sufficient exits to ensure prompt escape in cases of emergency?

( ) ( ) 4. Are adequate controls established and posted for areas requiring limited occupancy?

( ) ( ) 5. Is the exterior egress from the emergency exit to designated safe areas smooth, solid, and substantially level?

( ) ( ) 6. Are special precautions taken to provide employees with adequate exits during construction and rehabilitation work?

( ) ( ) 7. Are latches or other fastening devices on exit doors provided with a panic bar for easy exit?

FIRE PROTECTION
29 CFR 1910.155

( ) ( ) 1. Is there an adequate number of the appropriate type of portable fire extinguishers? (total travel distance does not exceed 75 feet for a Class A fire or 50 feet for a Class B fire)?

( ) ( ) 2. Are fire extinguishers serviced annually and such service properly noted on the inspection tag?

( ) ( ) 3. Are fire extinguishers mounted in readily accessible locations?

( ) ( ) 4. Are fire extinguisher locations marked with a readily visible sign?

( ) ( ) 5. Are fire extinguishers inspected monthly for general condition and operability? Is the monthly inspection recorded on a tag attached to the extinguisher?

( ) ( ) 6. Is the fire alarm system tested at least once a year?

( ) ( ) 7. Are evacuation drills conducted at least once a year?

( ) ( ) 8. Are employees periodically instructed in use of extinguishers and fire protection procedures?

( ) ( ) 9. Is the emergency evacuation plan current and posted throughout the building?

( ) ( ) 10. Are any interior standpipes and valves inspected regularly?

( ) ( ) 11. Are fire doors and shutters in good operating condition? Are fusible links in place,unobstructed, and protected from obstruction?

( ) ( ) 12. Is the local fire department well acquainted with the facilities and any specific hazards?

HOUSEKEEPING AND GENERAL WORK ENVIRONMENT 29 CFR 1910.141

( ) ( ) 1. Are halls, passageways, storerooms, and service rooms kept in a clean, orderly, and sanitary condition?

( ) ( ) 2. Is the general work area free from clutter and excess accumulation of paper or other debris?

( ) ( ) 3. Are food products not kept in the same refrigerator as batteries, film, chemicals, or other nonfood products?

( ) ( ) 4. Are rubbish and litter disposed of daily?

( ) ( ) 5. Are there tripping hazards in halls, walkways, or work areas?

( ) ( ) 6. Are carpets well secured to the floor and free of worn or frayed seams?

( ) ( ) 7. Is smoking permitted in designated smoking areas only?

( ) ( ) 8. Are "no smoking" signs prominently posted for areas containing combustibles and flammables?

( ) ( ) 9. Do toilet facilities meet the requirements of applicable sanitary codes?

( ) ( ) 10. Are adequate washing facilities provided?

( ) ( ) 11. Are all areas of the facility adequately illuminated?

( ) ( ) 12. Are the building ventilation systems regularly checked for their performance and balanced when necessary?

( ) ( ) 13. Are stairways in good condition, with standard risers provided for every flight having four or more risers? Are nonslip treads provided?

( ) ( ) 14. Have weeds or other combustible material been removed from within 20 feet of any building?

( ) ( ) 15. Are portable ladders adequate for their purpose, in good condition, and provided with secure footing?

( ) ( ) 16. Are fixed ladders adequate, in good condition, and equipped with side rails or cages or special climbing devices, if required?

( ) ( ) 17. Are all areas below seven feet in height free from nails, hooks, screws, and any other sharp protruding object.

MEDICAL AND FIRST AID
29 CFR 1910.151

( ) ( ) 1. If a hospital or medical clinic is not located near your facility, are one or more employees trained in first aid?

( ) ( ) 2. Are the first-aid supplies adequate for the type of potential injuries in the workplace?

( ) ( ) 3. Are there quick water-flush facilities available where employees are exposed to corrosive materials?

MACHINES AND EQUIPMENT
29 CFR 1910.212

( ) ( ) 1. Are all machines or operations that expose operators or other employees to rotating parts,pinch points, flying chips, particles, or sparks adequately guarded?

( ) ( ) 2. Are mechanical power transmission belts and pinch points guarded?

( ) ( ) 3. Are hand tools and other equipment regularly inspected for safe condition?

( ) ( ) 4. Whenever compressed air is used for cleaning, is the pressure reduced to 30 psi or less?

( ) ( ) 5. Are power saws and similar equipment provided with safety guards?

( ) ( ) 6. Are grinding wheel tool rests set to within one eighth inch or less of the wheel?

( ) ( ) 7. Are grinding wheels worn or cracked?

( ) ( ) 8. Are all machinery and equipment kept clean and properly maintained?

( ) ( ) 9. Are power saws and similar equipment provide with proper safety guards?

( ) ( ) 10. Are radial arm saws equipped with an automatic return?

( ) ( ) 11. Are table saws equipped with anti-kickback devices?

( ) ( ) 12. Are eye guards and other protective equipment located near the machine area?

COMPRESSED GASES
29 CFR 1910.101

( ) ( ) 1. Are compressed gas cylinders examined regularly for obvious signs of defects, deep rusting, or leakage?

( ) ( ) 2. Are compressed gas cylinders securely fastened and capped at all times when not in actual use?

( ) ( ) 3. Are compressed gas cylinders moved only with an appropriate dolly?

( ) ( ) 4. Are compressed gas cylinders segregated so that full or empty oxidizers and flammable gases are stored separately?

FLAMMABLE LIQUIDS
29 CFR 1910.106

( ) ( ) 1. Are approved safety cans or other acceptable containers used for handling and dispensing flammable liquids?

( ) ( ) 2. Are contents of safety cans or other acceptable containers clearly marked in large letters on the outside of the container?

( ) ( ) 3. Are all flammable liquids that are kept inside buildings stored in proper storage containers and placed in approved flammable storage cabinets?

( ) ( ) 4. Is storage of flammable materials at the work area limited to only a one day's supply, with all excess materials returned to the flammable storage cabinet at the end of the workday?

( ) ( ) 5. Are flammable storage sheds provided with adequate ventilation?

( ) ( ) 6. Are properly designed electrical wiring and equipment installed in flammable storage sheds?

( ) ( ) 7 Do flammable storage sheds have a clear aisle at least three-feet wide?

( ) ( ) 8 Is there at least one portable fire extinguisher located outside, but not more than 10 feet from the door of the flammable storage shed?

( ) ( ) 9. Are containers of over 30-gallon capacity not stacked?

( ) ( ) 10. Are "no smoking" signs posted and smoking regulations strictly enforced in areas used for storage of flammable liquids?

WELDING, CUTTING, AND BRAZING
29 CFR 1910.251

( ) ( ) 1. Are only authorized, trained personnel permitted to perform welding, cutting, or brazing operations?

( ) ( ) 2. Have operators been provided a copy of operating instructions and directed to follow them?

( ) ( ) 3. Are welding-gas cylinders stored so they are not subjected to damage?

( ) ( ) 4. Are valve-protection caps in place on all cylinders not connected for use?

( ) ( ) 5. Are all combustible materials located near the operator covered with protective shields or otherwise protected?

( ) ( ) 6. Is a fire extinguisher provided at the welding site?

( ) ( ) 7. Do operators have the proper protective clothing and equipment?

PERSONAL PROTECTIVE EQUIPMENT
29 CFR 1910.132

( ) ( ) 1. Are hard hats provided and worn where any danger of falling objects exists?

( ) ( ) 2. Are protective goggles or glasses provided and worn where there is any danger of flying particles or splashing of corrosive materials?

( ) ( ) 3. Are protective gloves, aprons, shields, or other equipment provided for protection from sharp, hot, cold,or corrosive materials?

( ) ( ) 4. Are approved respirators provided for regular or emergency use where needed?

( ) ( ) 5. Is all protective equipment maintained in a sanitary condition and readily available for use?

( ) ( ) 6. Is special equipment available for electrical workers?

( ) ( ) 7.Are noise protection devices available?

HAZARD COMMUNICATION
29 CFR 1910.1200

( ) ( ) 1. Is a written Hazard Communication Plan on file?

( ) ( ) 2. Have all hazardous materials been inventoried, with the inventory made available to all employees?

( ) ( ) 3. Have employees been trained in the use of hazardous materials that they might use or come in contact with?

( ) ( ) 4. Are all hazardous-material containers properly labeled?

( ) ( ) 5. Are Material Safety Data Sheets (MSDS) available for all hazardous materials?

( ) ( ) 6. Are all containers of hazardous materials properly stored?

( ) ( ) 7. Is storage of hazardous materials at the work area limited to a one-day's supply, with all excess quantities returned to the storage area at the end of the workday?