Table of Contents

Section 1.01 Scope, Authority, and Purpose

1. Scope

This section sets forth the scope, authority, and purpose of the Reclamation Safety and Health Standards. The standards prescribe the safety and health requirements for all Bureau of Reclamation (Reclamation) activities and operations. All contracts or agreements for performance of work on Reclamation facilities must incorporate provisions for compliance with these standards. These standards are consistent with the health and safety standards prevalent in industry, the Occupational Safety and Health Act of 1970 (Public Law 91-596), and Department of the Interior regulations.

2. Authority

Federal law and departmental regulations grant the authority to expend funds and labor to develop and implement programs that protect the safety and health of Federal and contractor employees and prevent accidental damage of Government property. See 5 United States Code (U.S.C.) § 7902; Sections 6 and 19 of Public Law 91-596, Occupational Safety and Health Act of 1970; 29 U.S.C. § 651 et seq.; 43 U.S.C. § 1457; Executive Order 12196; 29 Code of Federal Regulations (CFR) 1960; Contract Work Hours and Safety Standards Act; and the Department of the Interior Departmental Manual, Part 485 (485 DM).

3. Purpose

The purpose of these standards is to help Reclamation personnel, contractors, and visitors to understand and comply with the safety and health safety requirements for operations performed or controlled by Reclamation.

4. General Requirements

These standards are incorporated into the Reclamation Manual by reference through Reclamation Manual Directive and Standard, Occupational Safety and Health – General (SAF 01-01), paragraph 6.(D), under deviations authorized by the Commissioner and dated December 22, 2009, and June 28, 2019, respectively.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.02 General Requirements

1. Scope

This section sets forth the general requirements of the Reclamation Safety and Health Program. These general requirements apply to all operations on Bureau of Reclamation (Reclamation) facilities, waters, and lands.

2. General Requirements

Reclamation must provide and maintain a working environment that is safe and free of risks to safety and health, so far as is reasonably practicable.

3. Responsibilities

a. Regional/Area Office Coordinators

- Shall provide and maintain a working environment free of hazards, including but not limited to, implementing and enforcing all applicable program elements and provisions of these standards.
- Shall ensure that facilities and equipment conform fully to the requirements contained and referenced in these standards.

b. First Line Supervisors

- Shall provide each employee with a general safety orientation.
- Shall provide each of their employees with training on specific hazards of their job and ensure that employees complete all required safety training.
- Shall investigate all injuries and illnesses and report their findings in the Safety Management Information System (SMIS).

c. People Doing the Work

- Shall observe all safety and health regulations and comply with instructions issued by their supervisor.

4. Training, Certification, and Qualification

a. Initial

- Orientation. All employees must receive an orientation on provisions of the safety and health program. The orientation shall cover:

    - applicable requirements of safety and health policies,
    - accident and injury reporting procedures,
    - first aid and medical care procedures,

- first aid and medical care procedures,
- emergency response protocols,
- applicable safety and health standards, and
- sources of information on safety and health protocols

- Job Specific. All employees shall receive training about hazards and hazard control methods specific to their job.

b. Certification

The supervisor is responsible for providing this training and ensuring that employees possess the necessary qualifications, licenses, and permits required to perform such work.

5. Safe Practices

a. Stop Work Authority

Every person has the authority to stop work if they observe and have a reasonable belief that a safety hazard exists and will lead to imminent danger. Appendix A of SAF P01, Stop Work Procedures, lists the procedure for this process.

b. Other Codes and Statutes

In addition to the requirements set forth in these standards, all operations on Reclamation facilities and operations utilizing Reclamation equipment must comply with applicable Federal and Department of the Interior (Department) health and safety standards, codes, and regulations. Where a difference exists, the more stringent provision will prevail. State Occupational Safety and Health Administration (OSHA) regulations, in most cases, have no authority over Federal agencies, Federal employees, or Federal facilities as the Department and Bureau of Reclamation have not relinquished their sovereign immunity. State OSHA agencies and standards typically do, however, have authority over Federal contractor operations and contract employees performing work on Reclamation property and within Reclamation facilities.

c. Deviations

No deviation to the provisions of these standards shall be approved that endangers the health and safety of any person, that is not consistent with the intent of the provisions of these standards, or that would be a deviation to a Federal or State regulation. If the literal application of a provision of these standards is impractical or creates conflicts, the issuing authority, in consultation with safety and health professionals, may authorize a deviation to the provision. All requests for a deviation shall be submitted in writing to the Policy and Programs (P&P) Director. The written request must include (1) a reference to the specific provision of the standard that requires a deviation, (2) an explanation of the problem with the provision, and (3) the proposed adaptation to the standard. The request must contain pertinent technical data, drawings, material or equipment specifications, and any other information that will enable the P&P Director

to decide. The operation in question must not proceed until the P&P Director provides written approval.

6. Accident, Injury, and Illness Reporting

a. Reclamation

Reclamation employees must investigate and report accidents and incidents using the SMIS. Reclamation must immediately report any accident involving a fatality, hospitalization, amputation, or loss of an eye to the appropriate OSHA office.

b. Non-Federal Operators at Reclamation Facilities

Operators must report all third-party injuries, deaths, or substantial property losses that result or could result in claims against the Government to the appropriate Reclamation office.

c. Contractors

Contractors must report and investigate injuries and incidents in accordance with RSHS Section 1.03, Contractor Requirements.

7. Alcohol, Drugs, and Firearms

Reclamation does not permit the use of intoxicating beverages and narcotics on Government property. No one who is impaired while under the influence of alcohol, narcotics, or prescription drugs is permitted on the job site. Employees using medications(s) must ensure that their performance will not be impaired. Unauthorized firearms are not permitted on Reclamation property.

a. Housekeeping

All work areas must maintain good housekeeping. All work areas shall be neat and orderly, including office spaces.

b. Environmental Stewardship

Handling, storing, using and disposing of waste shall not contaminate or pollute water, air, or ground. Disposal must comply with all Federal, State, and local regulations. Facilities will follow Reclamation ENV 05-01, Environmental Management System (EMS) Implementation and ENV P05, The Bureau of Reclamation's Commitment to Environmental Stewardship.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.03 Contractor Requirements

1. Scope

This section sets forth requirements for contractors. The purpose of these requirements is to establish minimum health and safety requirements. Contractors are expected to establish safety as a core value while working on Reclamation facilities. This section specifically addresses contractor responsibilities, certification requirements, safety programs, required meetings, safety and health professional support, inspection requirements, accident and incident investigating and reporting, monthly accident summary report, training requirements, dismissal of employees who refuse to comply with occupational safety and health requirements, and dispute resolution. The contractor services covered by this section may include, but are not limited to, the following:

- construction and construction project management,
- event organization,
- facility management and maintenance,
- equipment installation, repair, routine service and maintenance,
- food service and catering,
- janitorial service (office cleaning),
- landscaping,
- security, and/or
- other similar services.

This section does not include shipping, receiving, delivery, and transportation services.

Contractors shall adhere to the requirements set forth in all sections of the Reclamation Safety and Health Standards (RSHS) when performing work, with the exceptions listed below. The following sections are specific to Reclamation employees or Reclamation programs and are not applicable to contractors:

- Section 1.16, Hazardous Materials Emergency Response,
- Section 4.12, Watercraft and Dredging,
- Section 2.07, Hearing Loss Prevention Program,
- Section 2.08, Respiratory Protection Program,
- Section 1.19, Hazard Communication Program,
- Section 2.09, Bloodborne Pathogens,
- Section 1.20, Safety and Occupational Health Program Evaluations,
- Section 1.21, Motor Vehicle Safety,
- Section 1.22, Accident Investigation and Reporting,
- Section 1.23, Safety Inspection and Abatement, and
- Section 1.24, Collateral Duty Safety Representatives.

Contractors shall comply with applicable Federal, State, and local regulations when performing work related to the RSHS sections above.

2. General Requirements

a. Certification Requirements

The manufacturer or a professional engineer (PE) must certify that the design of major or critical facilities, equipment, support structures, systems, embankments, shoring systems, and formwork (falsework) is structurally suitable for the intended use. This certification must be in writing and submitted to the Contracting Officer's Representative (COR) before construction or use of such facilities, equipment, or support systems.

b. Contractor Identification

The contractor is responsible for identifying all personnel, including the personnel's level of training, that hold special positions as certified, designated, or competent persons and the equipment and operations for which they are responsible.

c. Required Safety Meetings

- Joint Safety Policy Meeting. The COR, the contractor's principal onsite representative, and designated members of respective staffs must participate in scheduled monthly safety meetings. These meetings must review the effectiveness of the contractor's safety effort, resolve health and safety problems relating to current operations, and provide a forum for planning safe future activities. The contractor must prepare and maintain meeting minutes in a manner prescribed by the COR.
- Contractor Safety Program Review. After the contractor submits the written safety program requirements, the contractor must hold a meeting to review the program, and the contractor's principal onsite representative, general superintendent, the COR, and the safety representative must attend. The contractor must discuss the procedures to control the hazards likely to happen during major phases of the work and the organizational assignments involved in administering the program, in detail.
- Supervisory Safety Meetings. The contractor must conduct regularly scheduled (at least monthly) supervisory safety meetings for all levels of job supervision. The contractor must maintain a summary report containing all attendee signatures and make the report available for review by the COR.
- Toolbox Safety Meetings. Each field supervisor or foreman must conduct at least one on-the-job or toolbox safety meeting each week, and all employees under their supervision must attend. The field supervisor or foreman must maintain a record of each meeting, including signatures of attendees, and make the report available for review by the COR. These meetings will discuss upcoming work, hazards the work may introduce, methods and precautions to eliminate or mitigate hazards, interface with Reclamation employees, and recognizing/reporting new hazards.

3. Responsibilities

a. Regional Safety and Occupational Health Office

- Must consult with the area office safety and occupational health office or the construction office safety manager about any site special hazards or special conditions that might exist during the project.

b. Contract Employer

- Shall ensure that all work under contract meets or exceeds the Occupational Safety and Health Administration safety and health standards and complies with the RSHS contained herein.
- Shall comply with all Federal, State, and local requirements. When the requirements of one standard are in conflict with the requirements of another, the standard offering the highest level of protection to the worker, equipment, or facility must be followed.
- Shall ensure safe work performance by employees and subcontractors.
- Shall apply these standards to offsite activities, equipment, and facilities that primarily support the contract work.
- Shall include provisions for meeting the safety and health requirements of these standards in the terms and conditions of all contracts, subcontracts, and supply contracts.

4. Training Requirements

a. Initial Orientation

The contractor must give each new contractor employee a written notice containing pertinent provisions of the safety and health program. The notice must indicate general policy and set forth procedures and regulations applying to the work environment, accident reporting, and first aid and medical care. Each employee must acknowledge receiving these instructions. The contractor must file this acknowledgment and make it available for review.

b. Certification

The contractor must ensure that all positions requiring certification are filled by currently certified personnel (e.g., CPR certification, crane operation training/certification, etc.).

c. Supervisor Training

All contractor onsite supervisors, including foremen, must attend a classroom review of applicable safety and health requirements within 30 days after construction begins and annually thereafter. Supervisors and foremen who begin work between formal training sessions must receive initial instructions from the contractor's safety representative and attend all subsequent annual reviews.

- Materials and Resources. Qualified trainers must use these standards and the contractor's safety program as a text for all training sessions. A Reclamation safety professional will be available for the formal classroom reviews to assist with safety and health standards.
- Recordkeeping. The contractor must maintain records detailing course content and the names of attendees and make the records available for review by the COR.
- Exceptions. The COR may grant exceptions to supervisory training requirements for short-term contracts or other discretionary reasons.

5. Hazard Identification, Assessment, and Safety Measures

a. Safety and Health Professional Support

When the contract does not require the services of a full-time safety professional, the contractor must designate, in writing, a competent supervisory employee who is acceptable to the COR to administer the safety program. However, if the COR considers the contractor's safety effort inadequate, the COR may require the contractor to employ a full- time qualified safety professional in place of a safety representative. These standards make further provisions for using safety and health specialists when special or technical expertise is required.

b. Required Inspections

The contractor must ensure competent employees conduct frequent and regular (at least weekly) safety inspections of the worksites, materials, and equipment. The contractor must maintain detailed written inspection records and make them available for review by the COR.

c. Prohibited Tools and Materials

The contractor must prohibit the use of any machinery, tool, material, or equipment that is not safe or does not comply with applicable requirement of these standards. The contractor must identify such machine, tool, material, or equipment as unsafe by tagging or locking the controls to make them inoperable or by physically removing it from the worksite.

d. Accident and Incident Reporting

Contractors must immediately report accidents and incidents to the COR and the appropriate contractor personnel. For each injured person, the contractor must complete Reclamation Form 7-2077, Contractor's Report of Recordable Injury/Illness, and submit it to the COR (see Appendix 1.03-A, below).

- Accident Response. The contractor is responsible for providing and obtaining appropriate medical and emergency assistance and notifying the coroner, fire, and law enforcement agencies; the Occupational Safety and Health Administration; and family members. Except for rescue and emergency measures, do not disturb the scene of the accident or incident and do not resume the operation until authorized by COR.

- Accident and Incident Investigation. The contractor must assist and cooperate fully with the COR in conducting the investigations of the accident/incident and ensure availability of all information, personnel, and data pertinent to the investigation. When ordered by the COR, the contractor must conduct a separate and complete independent investigation of the accident or incident and submit a comprehensive report of findings and recommendations to the COR. The contractor must arrange, and be financially responsible, for the independent investigation and any equipment/material inspections or tests or diagnostic studies required by the Government or contractor investigators.
- Nonserious Accidents. The contractor must report nonserious accidents or incidents immediately to the contractor supervisor who has been delegated authority to arrange for medical assistance and to investigate the accident or incident. After arranging for required medical assistance, the responsible supervisor must investigate the accident/incident.
- Documentation. Within 3 working days following the accident, the contractor must submit to the COR (1) a completed Reclamation Form 7-2077, Contractor's Report of Recordable Injury/Illness, for all personal injuries and (2) a comprehensive narrative report for property damage accidents.

e. Potentially Serious Accidents

The contractor must immediately report potentially serious accidents or incidents to the COR. The contractor's involved equipment and worksite must remain secured until the contractor has completed a comprehensive investigation that is acceptable to the COR and the COR has given permission to resume work.

- Documentation. Within 5 days following the investigation, the contractor must submit a detailed, written, investigation report to the COR.

f. Monthly Accident Summary Report

By the first day of each month, the contractor must submit a completed Reclamation Form 7-2218, Contractor Recordable Accident Experience (see Appendix 1.03-B below), or an equivalent report acceptable to the COR.

g. Dispute Resolution

If disputes involve safety issues, the work must not proceed until the dispute is resolved.

6. Pre-job Briefing and Planning Requirements

a. Contractor Safety Program Review

The contractor must submit a comprehensive written safety program covering all aspects of onsite and applicable offsite operations and activities associated with the contract (see RSHS Appendix 1.03-C, Contractor Safety Program, below). Unless adequately covered in the original plan, the contractor must submit a supplementary detailed plan before starting each major

phase of work or when requested by the COR. Initial and supplementary submittals must include a timetable for completing required detailed job hazard analyses (JHAs).

b. Review and Acceptance

Onsite work must not begin until the COR has accepted the program or appropriate supplementary submittals. Acceptance of contractor initial and supplementary programs signifies only that the contractor has provided adequate documentation to safely perform the work. It does not relieve the contractor of the responsibility for providing employees with a safe and healthful work environment or compliance with stated requirements and applicable specification paragraphs.

7. Hazardous Environmental Conditions (Weather/Other)

a. Lightning Plan

If the construction site is in an area where lightning is common, the contractor shall have a lightning plan, as described in RSHS Section 1.04, Work Safety Planning.

b. Wind Conditions

If the construction site is in an area where severe wind conditions are common, the contractor must monitor wind speeds and follow the restrictions for crane operations listed in RSHS sections 3.03, Permanently Installed (Fixed) Cranes, and 3.04, Mobile Cranes.

8. Safe Practices

a. Refusal to Comply with Occupational Safety and Health Requirements

The contractor must remove employees who refuse or repeatedly fail to comply with safe work practices and standards from the site.

b. Supervisors Who Fail to Enforce Occupational Safety and Health Requirements

The contractor must remove supervisors who fail to enforce safety and health requirements from the site.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 1.03-A: Form 7-2077, Contractor's Report of Recordable Injury/Illness

Appendix 1.03-A (Form 7-2077: Contractor's Report of Recordable Injury/Illness) from RSHS Chapter 1, Section 1.03 is available to print at:
https://teamssp.bor.doi.net/printanddup/forms/7Forms/7-2077.pdf

Appendix 1.03-B: Form 7-2218, Contractor Monthly Summary of Occupational Injury/Illnesses Experience

Appendix 1.03-B (Form 7-2218: Contractor's Monthly Summary of Occupational Injuries/Illnesses Experience) from RSHS Chapter 1, Section 1.03 is available to print at:
https://teamssp.bor.doi.net/printanddup/forms/7Forms/7-2218.pdf

Appendix 1.03-C: Contractor Safety Program

Program Outline

I. General Requirements
   - A. Statement of Policy
   - B. Statement of Safety and Health Responsibilities
   - C. Statement of Compliance with Regulations, Standards, and Codes
   - D. Statement of Subcontractor Compliance
   - E. Safety Inspection Procedures
   - F. Accident Investigation and Reporting Procedures
   - G. Applicable Emergency Plans
   - H. Required Safety Program Coordination
     1. Confined Space Program
     2. Control of Hazardous Energy (Lockout/Tagout) Program
     3. Hearing Loss Prevention Program
     4. Respiratory Protection Program

II. Fire Protection Plans
   - A. Type and Location of Suppression Equipment or Systems
   - B. Offsite Assistance Agreement
   - C. Temporary Heating Devices

III. Medical
   - A. Facilities
   - B. Training

C. Certifications
D. Physician
E. Ambulance (Name, Location, and Telephone Number)
F. Physical Qualifications of Employees
G. Records

IV. Communications
A. Employee Training
B. Safety Meetings
C. Onsite Training
D. Supervisor Training

V. Occupational Health
A. Procedures and Equipment to Minimize Hazards
B. Testing Programs for Employees and Work Environments
C. Qualified Personnel
D. Personal Protective Equipment (PPE)
E. Ventilation Plans

VI. Machinery and Mechanical Equipment
A. Procedures and Equipment Used to Minimize Hazards
1. Testing Program for Employees and Work Environments
2. Mobile and Stationary Equipment
B. Inspection Procedures
C. Maintenance Procedures
D. Operating Personnel
E. Protective Safety Devices and Certifications
F. Elevators and Aerial Lifts

VII. Excavation and Demolition
A. Tunnels and Shafts
1. Internal Combustion Engines
2. Ventilation Plans
3. Transportation Systems and Equipment
4. Work Environment Testing
5. Ground Support
B. Blasting
1. Blaster Certification
2. Written Procedures
3. Storage

4. Transportation

C. Excavations Other than Tunnels and Shafts
   1. Slide Protections
   2. Support Systems
   3. Inspections
   4. Access

D. High Scaling
   1. Definition
   2. PPE
   3. Standing Operating Procedures

E. Haulage
   1. Haul Roads
   2. Equipment and Procedures

VIII. Working Surfaces

A. Access
   1. Ladders
   2. Platforms, Stairways, and Ramps

B. PPE

C. Scaffolding

D. Safety Nets

IX. Protection of the Public

A. Signs and Barricades

B. Flagging Procedures

C. Jurisdictional Approvals

X. Marine and Diving Operations

A. Detailed Plan and Written Procedures

XI. Electrical Facilities

A. Substations

Section 1.04 Work Safety Planning

1. Scope

This section sets forth the requirements of work planning. It includes hazard assessment, job hazard analyses (JHAs), communications, emergency response plans, site safety plans, lightning hazards, and lone work plans. This section applies to all Reclamation and contractor activities.

2. General Requirements

a. Hazard Assessments

The responsible supervisor must assure that a workplace or work activities assessment is completed to determine if hazards are present or are likely to be present. The supervisor can complete a pre–job hazard analysis from Appendix 1.04-A; if warranted, the supervisor will ensure a written JHA is completed to identify all potential hazards. If potential exists for exposure to any chemical, physical, or biological agent that may have a detrimental effect, the supervisor must ensure that a health hazard assessment is included with the JHA.

b. Facility Safety

To help manage the safety and health of Reclamation employees, contractors, and visitors, each site should develop its own customized annual site safety plan. This allows the site's management to share its philosophy, expectations, and requirements for safety and health at the facility. It is also a means for documenting and communicating to employees the site annual safety goals.

3. Responsibilities

a. Area Office Program Coordinators

- Shall ensure that JHAs are being created and followed when appropriate.
- Shall assist first-line supervisors with mitigation measures for complex hazards or work tasks.
- Shall ensure that a fatigue management plan is created and followed by all appropriate personnel (when applicable).
- Shall assist in the creation of the site safety plan.
- Shall assist in the preparation of the emergency response plan.

b. First Line Supervisors

- Shall ensure that JHAs are prepared and followed before each job is assigned.
- Shall assist and advise the team preparing the JHA to ensure that all appropriate hazards are addressed in the JHA.

- Shall assist and advise the team preparing the JHA to ensure that all appropriate hazards are addressed in the JHA.
- Shall ensure that all personnel are trained on JHAs, fatigue management, and emergency response plans.

c. Onsite Job Leads

- Shall ensure that all employees involved in a task covered by a JHA are familiar with and understand the JHA.
- Shall assist in the preparation of all JHAs for tasks with which they are involved.

d. People Doing the Work

- Shall review the JHAs for the work they do, understand the JHA requirements and methods to mitigate any hazards, and follow the JHA guidance.
- Shall understand emergency response procedures and follow those procedures during an emergency.
- Shall follow the fatigue management plan to minimize fatigue-related hazards.

4. Training Requirements

a. Initial.

All employees are required to be trained initially on JHA preparation and use, emergency response procedures, the site safety plan, and the fatigue management plan. No work will be assigned to an employee until they have been trained on and demonstrated these procedures.

b. Physical Qualification

All employees must be physically and medically qualified, as appropriate, for performing their assigned duties.

c. Certification

Supervisors shall ensure employees are certified or qualified as required in all sections of the Reclamation Safety and Health Standards. All field supervisors should be certified in first aid and cardiopulmonary resuscitation (CPR).

5. Hazard Identification, Assessment, and Safety Measures

a. Requirements for JHAs

The responsible supervisor must review any completed risk assessments and all tasks associated with a job to determine if a JHA is required. When developing the JHA, the job lead can use the optional Pre-Job Hazard Checklist (Appendix 1.04-A) and the following JHA process flow chart to guide the process.

FIGURE 1.04-1 Flow chart for use in determining whether a JHA is required for a job.

When a JHA is deemed necessary	When a JHA is deemed not necessary
Step 1: Job Supervisor completes pre-JHA form.	Step 1: Conduct pre-job meeting with employees
Step 2: Conduct pre-job meeting. Employees review and sign the JHA.	Step 2: Job is initiated and completed.
Step 3: Job is initiated and completed.	Step 3: Conduct post work review.
Step 4: Post work review. Discuss near misses and hazards.	N/A
Step 5: Revise the JHA to reflect post work review.	N/A

In making the assessment, the supervisor must consider mechanical, electrical, pressure, temperature, chemical, biological, radiation, sound, gravity, or motion hazards that can result in death or serious bodily injury. Examples of such hazards can include the following:

- being struck by falling or flying objects,
- getting pinched in/between or caught in rotating machinery,
- lifting excessive weight or lifting frequently,
- repetitive motion,
- electrical shock,
- radiation from welding and other sources,
- drowning,
- significant exposure to toxic or hazardous substances, gases, fumes, and atmospheres, and
- falls from heights above 4 feet.

b. Completing the Job Hazard Analysis

If the supervisor determines a JHA is required, the supervisor or their designated employee must consult with the employees involved in the activity and, if necessary, the local safety and health professional to develop a JHA. The job lead must review and sign the JHA, and the reviewing official must approve the JHA to indicate all appropriate hazards are addressed. The supervisor or their designated employee must then review the JHA with employees at a pre-job meeting before performing the work. A copy of the JHA must be maintained at the work site.

c. Written Procedures

Written procedures or job plans may be attached to the JHA as additional documentation; however, step-by-step procedures will be incorporated into the JHA.

d. Elements of a Job Hazard Analysis

Record developed written procedures using the sample Reclamation-wide standard form in Appendix 1.04-B: Job Hazard Analysis. At a minimum, the JHA must include the following basic elements:

- title identifying the project and specifying the operation,
- a number used for recording and indexing,
- emergency information, including physical location and emergency phone number(s),
- the date, to ensure the procedure is current,
- description of work to be performed,
- equipment, tools, and facilities involved,
- required employee knowledge, skills, physical ability, and certifications,
- principal or significant steps/tasks/activities of the operation in sequence, and
- approval signatures.

Guidance for Significant Steps. Supervisors will divide operations into only the number of significant steps/tasks/activities necessary to ensure adequate consideration of important items. Significant steps are those that encompass major aspects of the work. Limit the JHA to 7 to 10 significant steps/tasks/activities, and no more than 15 if the entire job is included.

- When evaluating the hazards of each significant step, include all hazards associated with the entire step without becoming encumbered by the details. Comprehension of the related safety message is enhanced if the document contains only brief, succinct points versus lengthy, complex narratives. Examples of significant steps include the following:

    - remove head cover,
    - remove old gasket,
    - clean gasket surface,
    - replace gasket, and
    - replace head cover.

- Risk Assessment. The determination of risk is a subjective, qualitative process that considers the criticality of the task, process, or condition. When assessing risk, consider physical, chemical, and/or biological hazards for each step of the job task. For high-risk hazards, use the DOI Operational Risk Management Assessment matrix (https://www.smis.doi.gov/safetynet/information/program/ORMP.html) as appropriate. The risk assessment matrix uses a combination of severity (the most serious type of injury or illness that can reasonably be expected from exposure to a hazardous condition) and probability (the likelihood that a condition will occur) to provide a decision maker with accurate information he or she can use to make informed decisions concerning appropriate risk controls.
- Hierarchy of Controls. Identify hazard control measures using the hierarchy of controls:

  - elimination of the hazard,
  - substitution,
  - engineering controls,
  - administrative controls, and
  - safety equipment and personal protective equipment (PPE).

- When using safety equipment and/or PPE as a hazard control measure, the supervisor or foreman must provide employees with the specific safety equipment that is required. For example, instead of simply stating that a respirator is required, the supervisor/foreman must provide employees with a full-face negative pressure respirator with combination HEPA and organic vapor cartridge.
- Required Training. JHAs must identify any required training (e.g., forklift training, Class 2 Asbestos training, etc.) and job leads must confirm that involved employees' training is current.
- Required Certifications. JHAs must identify required certifications (e.g., crane operator certification) and job leads must confirm that involved employees' certifications are current.
- Required Signatures. JHAs must include signatures of the job lead and the reviewing official.
- Pre-approval Review for High-Risk Tasks. JHAs for tasks identified as high- risk that cannot be fully mitigated must be reviewed by a safety specialist or an industrial hygienist before approval by the job lead.
- Pre-approval Review for Significant-Exposure Tasks. JHAs for tasks identified as having significant risk of exposure to occupational health issues that cannot be fully mitigated must be reviewed by a safety specialist or an industrial hygienist before approval by the job lead.
- Post-job JHA Review. A post-job review must be performed by all team members involved in the task within seven days of job completion. This can be an informal review conducted after the work is completed, except when an activity resulted in a near miss, an injury, or damage to a facility. The JHA for a particular job/task must be updated to reflect lessons learned from the review, including any incidents involving a near miss, an injury, or damage to facility. The updated JHA must be approved by the appropriate supervisor.
- Manager Review of Updated JHAs. An appropriate manager must review the updated JHA in conjunction with the appropriate safety specialist and/or any necessary subject matter experts with 14 days of any near miss, injury, or damage to the equipment or facility.
- Reassessment During Work. As work is performed under a JHA, workers and supervisors can reassess the JHA to ensure that all significant hazards have been addressed and adequate hazard controls have been implemented. Job site monitoring and observation of work activities must be a basis for assessment and revision. All work

must stop whenever the JHA is determined to be lacking in identification or mitigation of hazards, or whenever the scope of work has changed. Work cannot restart until either a revised JHA or a new JHA is developed, discussed with all affected employees, and signed by all affected employees and the job lead.

e. Elements/Activities No Necessary in a JHA

It is not necessary to document every conceivable common hazard if the potential injury is not expected to require more than first aid treatment. Examples of such common day-to-day hazards include walking on level or slightly inclined surfaces, climbing standard staircases, lifting moderately light objects with little or no repetition, infrequent bending, operating a passenger vehicle, and using common hand tools and equipment.

f. High-Risk Tasks that Cannot be Mitigated

A high-risk task that cannot be mitigated requires the approval of the safety specialist and an appropriate manager (e.g., facility manager and area manager, regional office division chief, or equivalent) before the work can begin.

g. Emergency Call-Out Situations that Must Be Addressed Immediately

The job lead shall complete a pre-job hazard checklist and JHA, even if a supervisor is not available to sign the JHA. The job lead and the first-level supervisor shall discuss the JHA with the second-level supervisor after the work is completed.

h. Approvals

All approvals indicated on the JHA form shall be completed before activities begin, except in the circumstances described in paragraph 1.04.5.g. Verbal confirmation of approval can be used in special circumstances, for example, during an emergency call out.

6. Pre-Job Briefing and Planning Requirements

a. Pre-Job Meeting

All team members involved in the task must participate in a pre-job meeting before starting work. The job lead will review the pre-JHA checklist (optional) and discuss the JHA. All team members must participate in the discussion of the JHA and revise the JHA if needed.

7. Hazardous Environmental Conditions (Weather/Other)

a. Lightning Safety

There is no safe place outside when lightning is within 5 miles. (Sound travels 1 mile every 5 seconds. If lightning is observed and thunder follows within 30 seconds, then the lightning is within 5 miles.) Personnel will begin seeking shelter when lightning is observed within 25 miles, especially on lakes and waterways. Move inside a strong building or an enclosed hardtop vehicle, and avoid contact with plumbing and inside wiring, including appliances and corded phones, during a thunderstorm.

b. Requirements for Lightning Hazard Plans

When outdoor work is performed where a lightning hazard has been identified, a lightning hazard plan shall be developed. The lightning hazard plan shall contain, at a minimum, the following items:

- a designated person responsible for monitoring the weather to initiate the evacuation process when appropriate.
- a protocol to notify all persons at risk from the lightning threat. Depending on the number of individuals involved, a team of people may be needed to coordinate the evacuation plan.
- identified safe sites and a means to route the people to those locations, and
- an identified all clear signal that is considerably different than the warning signal.

8. Safe Practices

a. Working Alone

When employees must work alone and when the possibility of injury and inability to provide medical treatment could create life-threatening situations, supervisors must implement protective measures. The JHA process must determine appropriate measures and address the specific situations and hazards.

b. Communication

An effective means of communication must be available. This communication could include cellular phone, two-way radios, hardline telephones, and check-in and check-out procedures. Selected communication must be tested before the start of operations to verify that equipment will operate efficiently in the environment.

- Lone Workers. When an employee is working alone in an isolated location, communicate frequently to ensure the employee's safety. In some instances, employees (such as dam tenders) are stationed in isolated work areas and generally perform their duties alone. At a minimum, daily communication identifying activities and locations for that day is required.

c. Emergency Response Procedures

An emergency response plan must be in writing, and all employees must be informed about the plan and procedures. The emergency response plan must include provisions for emergency medical care and treatment. Include arrangements for ambulance service and emergency treatment and maintain a list of phone numbers. Contractors must submit emergency response plans to the contracting officer representative (COR) and the COR must approve the plan before the start of operations.

- Lone Workers. Employees working alone must have an effective way to obtain emergency assistance. If an employee misses a pre-determined check-in, initiate emergency procedures.

d. Fatigue Management

Supervisors must ensure a fatigue management plan (FMP) is developed for the following work patterns:

- work exceeds 10 hours a day for more than 4 consecutive days,
- work exceeds 50 hours in a 7-day work week,
- work exceeds 12 hours a day for more than 3 consecutive days, and
- work exceeds 58 hours a week for sedentary work (including office work)

e. Fatigue Management Plan Requirements

The FMP shall identify affected workers, management responsibility, training, and the controls established at the worksite. The FMP shall also address the circumstances, approval procedures, and precautions for exceeding the following conditions for operator work hour limitations.

- Equipment Operators. Equipment Operators. Operators of equipment, such as hoisting equipment and draglines, mobile construction equipment, electrically powered systems, hydropower plants, industrial manufacturing systems, hydraulically operated equipment, powered vessels, and boats, shall not be permitted to exceed 12 hours of duty time in any 24-hour period, including time worked at another occupation. A minimum of 8 consecutive hours of rest between shifts in a 24-hour period is required. See Appendix A for the definition of rest.
- Motor Vehicle Operators. Operators of motor vehicles while on duty shall not operate vehicles for a continuous period of more than 10 hours in any 24-hour period. Moreover, no employee may operate a motor vehicle while on duty after being in a duty status for more than 12 hours during any 24-hour period. A minimum of 8 consecutive hours shall be provided for rest in each 24-hour period.
- Training. Training shall include symptoms of fatigue, habits and actions the worker may take to avoid fatigue, actions workers should take if they observe fatigue in a coworker, and controls in place to prevent fatigue.
- Controls. Controls for fatigue may include work scheduling (limit number of consecutive night shifts), rotating jobs to prevent repetitive work, breaks at critical times in the work cycle, control of environmental factors (heat, cold, use of personal protective equipment), buddy check-in for individuals working alone, and alternate transportation for long commutes. Controls for fatigue shall include a discussion of driving to and from work and any possible mitigation of driving as a factor of fatigue.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 1.04-A: Pre-job Hazard Assessment Checklists

Appendix 1.04-A (Pre-job Hazard Assessment Checklists) are available to print at: https://www.usbr.gov/safety/rshs/

Appendix 1.04-B: Job Hazard Analysis

Appendix 1.04-B (Job Hazard Analysis Form) from RSHS Chapter 1, Section 1.04 is available to print at: https://teamssp.bor.doi.net/printanddup/forms/7Forms/7-2037.pdf

Bureau of Reclamation Job Hazard Analysis Form

Emergency Information	Job Location	GPS Location	Emergency Phone	Nearest Hospital	Law Enforcement	Ambulance

Job/Project Title: _____ **Date:** _____ **JHA #** _____

Job Description: _____

Equipment/Tools/Facilities Involved: _____

Applicable Regulatory References: _____

#	SIGNIFICANT STEPS/MAJOR ACTIVITIES IN SEQUENCE	HAZARDS (Physical, Chemical, Biological, Etc.)	HAZARD CONTROLS (Elimination, Substitution, Engineering, Administrative Control, Personal Protective Equipment)	HIGH RISK/EXPOSURE ASSESSMENT (Y/N)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Note: Divide operations only into the sequence of significant steps/major activities necessary to ensure adequate consideration of important items. It is suggested that when a JHA has more than 15 significant steps/major activities that the scope of work be evaluated for separation into multiple Job Hazard Analyses.

Required Training:	Required PPE:	Required Certifications, Licenses, Permits. Clearances, Critical Lift Plan, Entry Permits etc. (Confirm all are valid and current):

Additional information:

Job Hazard Analysis Review/Approval	Yes	No
Was the optional Pre-Job Assessment form used to help identify potential hazards?	◯	◯
If new High Risk Hazards were identified, was the JHA reviewed by a safety professional and a risk assessment completed if necessary?	◯	◯
Was an exposure assessment accomplished by an industrial hygienist for activities with newly identified potential health hazards?	◯	◯

Job Lead	Supervisor Approval
Signature:	**Signature:**
Date:	**Date:**

Safety Specialist Review (Only Newly Identified High Risk Hazard/Exposure Assessments that cannot be appropriately mitigated)	Industrial Hygienist Review (Only Newly Identified High Risk Hazard/Exposure Assessments that cannot be appropriately mitigated)
Signature:	**Signature:**
Date:	**Date:**

Facility Manager Approval (High Risk Hazard that cannot be appropriately mitigated)	Area Manager, or Regional Office Chief, or Equivalent Approval (High Risk Hazard that cannot be appropriately mitigated)
Signature:	**Signature:**
Date:	**Date:**

The following individuals have reviewed, UNDERSTAND, and acknowledge their responsibility to comply with this JHA and all attached documentation.

Date	Print Name	Signature	Date	Print Name	Signature

Post-Job Review	Yes	No
The contents of this Job Hazard Analysis was discussed with affected employees before they started assigned tasks.	◯	◯
An after action review was conducted with team members within 7 days of completion of all tasks associated with this job hazard analysis. Lessons learned were annotated below, and the JHA was updated within 30 calendar days.	◯	◯
Were there any incidents involving a near miss, injury, or damage to equipment or facility?	◯	◯
If yes, was the JHA reviewed by all team members and corrections made and reviewed by the Regional Office Division Chief/Facility Manager within 14 calendar days?	◯	◯

Lessons Learned (synopsis):

Job Lead	Supervisor Approval	Regional Office Division Chief/Facility Manager Review (JHA review required if an accident or near miss occurred)
Signature:	**Signature:**	**Signature:**
Date:	**Date:**	**Date:**

Section 1.05 Medical Services and First Aid

1. Scope

This section sets forth the requirements for emergency medical services and first aid for all personnel at Bureau of Reclamation (Reclamation) facilities and operations. It also applies to all contractor operations unless other specific plans have been made to address site-specific conditions and have been mutually agreed to in writing. Reclamation facilities with medical staff on site will evaluate how many people trained in first aid are needed and how many first aid supplies are needed.

2. General Requirements

Emergency medical services must be readily available for employees, and employees must know how and where to access the services or supplies.

a. Communication

Ensure that there are reliable means of communication (land line, cell phone, radio, or satellite phone) to contact emergency medical facilities and conspicuously post emergency phone numbers.

b. Signage

Clearly indicate the location of first aid kits or stations with posted signs.

c. Medical Emergencies

Supervisors shall provide specific guidance and training on actions to take in response to a medical emergency.

3. Responsibilities

a. Regional/Area Managers

- Shall ensure that the general requirements listed in paragraph 1.05.2 are met.
- Shall ensure that adequate first aid supplies are available and personnel are adequately trained to render first aid.
- Shall ensure an assessment is completed to determine the number of employees to be trained to administer first aid and cardiopulmonary resuscitation, (CPR), with a minimum of one employee per shift. The assessment will include analysis of the types of injuries and illnesses, hazardous operations, the work environment, and site configuration.

b. First Line Supervisors

- Shall ensure that each job hazard analysis (JHA) details how anticipated medical emergencies will be addressed when employees are working in the field.

- Shall ensure that one or more employees in the work group and all field staff are trained in first aid and CPR.

c. People Doing the Work

- Shall attend first aid and CPR training if assigned.
- Will have access and the capability to effectively use communication devices available at the work site.

4. Training Requirements

Employee training intervals for first aid and CPR must be in accordance with the recommendations of a nationally recognized first aid and CPR organization.

a. Communication Devices

Employees must be trained on any communication devices they are expected to use during a medical emergency.

b. Proficiency Qualification

In isolated or remote work locations, all employees must be qualified to administer first aid and CPR.

5. Section-Specific Standards and Requirements

a. First Aid Supplies

On projects with fewer than 100 people, typical first aid supplies (see paragraph 1.05.6 must be provided and accessible. At least one full kit must be provided for every 25 employees.

b. Additional First Aid Supplies

For larger operations (operations involving more than 100 people) or when multiple operations occur at the same location, supervisors must determine the need for additional first aid kits at the work site. The supervisor must choose first aid supplies in consultation with safety personnel assigned to the cover the site or a person competent in first aid and knowledgeable about the hazards of that workplace.

c. Vehicle First Aid Supplies

Government-owned large vehicles (greater than 10,000 Gross Vehicle Weight) or field-going vehicles, aircraft, and watercraft must carry a first aid kit.

d. First Aid Kit Inspection

Inspect first aid kits monthly (and weekly for construction activities). The label inside the kit lid must include an inventory of the kit's contents. The inspector must verify that the listed items are available and that the sterile packaging is intact. Record the date of the inspection on the inspection tag.

e. Ambulance and Emergency Services

Provisions for ambulance or emergency services must be planned prior to operations and must include consideration of medical air evacuation by helicopter. Ambulance service must be provided by an agency licensed to render such service.

6. Pre-job Briefing and Planning Requirements

Job hazard analyses shall identify any first aid or special emergency assistance needed before the job is started. Where the JHA indicates significant risks, the JHA must include provisions for first aid and medical assistance.

a. First Aid Kit Requirements

Occupational Safety and Health Administration (OSHA) regulations regarding first aid kits are contained in the Code of Federal Regulations under section 29 CFR 1910.151. OSHA does not provide specifications for first aid kit contents but defines mandatory requirements for availability of kits on worksites. The American National Standards Institute (ANSI) is referenced as the originator of first aid kit specifications and minimum contents requirements.

b. First Aid Kit Contents

ANSI Z308.1, Minimum Requirements for Industrial Unit-Type First Aid Kits, lists and establishes a minimum assortment of first aid treatment packages that first aid kits must contain. ANSI Z308.1 introduces two classes of first aid kits: Class A kits, with contents designed to deal with most common types of workplace injuries, and Class B kits, with a broader range and quantity of supplies to deal with more complex injuries or higher risk environments. Tables 1.5-1 and 1.5-2 list minimum contents for Class A and Class B first aid kits. The specific situation at your worksite must be reviewed by the facility management and safety personnel assigned to the site to determine if additional supplies will be included in your kit.

Table 1.05-1. ANSI Z308.1-2021 Minimum Fill Requirements for Class A First Aid Kits

Item	Quantity	Minimum Size or Volume
Adhesive Bandages	16	1×3 inches
Adhesive Tape	1	2.5 yards
Antibiotic Treatment	10	0.14 fl. oz. (0.5g) applications
Antiseptic	10	0.14 fl. oz. (0.5g) applications
Breathing Barrier	1	-
Burn Dressing	1	4×4 inches
Burn Treatment	10	1/32 oz. (0.9g) applications
Cold Pack	1	4×5 inches
Eye Covering	2	-
Eye Wash	1	1 oz.
First Aid Guide	1	-
Foil Blanket	1	52×84 inches
Hand Sanitizer	10	1/32 oz. (0.9g) applications
Medical Exam Gloves	4	-
Roller Bandage	1	2 inches × 4 yards
Scissors	1	-
Sterile Pads	2	3×3 inches
Trauma Pads	2	5×9 inches
Triangular Bandage	1	40×40×56 inches

⚠Table 1.05-2. ANSI Z308.1-2021 Minimum Fill Requirements for Class B First Aid Kits

Item	Quantity	Minimum Size or Volume
Adhesive Bandages	50	1×3 inches
Adhesive Tape	2	2.5 yards
Antibiotic Treatment	25	0.14 fl. oz. (0.5g) applications
Antiseptic	50	0.14 fl. oz. (0.5g) applications
Breathing Barrier	1	-
Burn Dressing	2	4×4 inches
Burn Treatment	25	1/32 oz. (0.9g) applications
Cold Pack	2	4×5 inches
Eye Covering	2	-
Eye Wash	1	1 oz.
First Aid Guide	1	-
Foil Blanket	1	52×84 inches
Hand Sanitizer	20	1/32 oz. (0.9g) applications
Medical Exam Gloves	8	-

Item	Quantity	Minimum Size or Volume
Roller Bandage	2	2 inches × 4 yards
Roller Bandage	1	4 inches × 4 yards
Scissors	1	-
Padded Splint	1	4×24 inches
Sterile Pads	4	3×3 inches
Tourniquet (with ratchet or windlass)	1	1 inch
Trauma Pads	4	5×9 inches
Triangular Bandage	2	40×40×56 inches

c. Required First Aid Kit Containers

First aid containers shall be of an appropriate type given the environmental conditions. The required type of container shall be determined by facility manager, project manager and/or medical and safety personnel. The following paragraphs and Table 1.5-3 describe the characteristics of the four types of ANSI Z308.1 first aid kit containers.

- Type I
    - Intended Use: Stationary, indoor settings
    - Potential for Damage: Minimal
    - Requirements: Minimum fill requirements and the means for mounting in a fixed position
    - Typical Applications: General indoor use, offices, manufacturing facilities
- Type II
    - Intended Use: Portable, indoor settings
    - Potential for Damage: Minimal
    - Requirements: Minimum fill requirements and the means to be portable
    - Typical Applications: General indoor use, offices, manufacturing facilities
- Type III
    - Intended Use: Portable use in mobile, indoor/outdoor settings
    - Potential for Damage: Not probable
    - Requirements: Minimum fill requirements, the means for mounting in a fixed position, water resistant seal
    - Typical Applications: General indoor use, sheltered outdoor use

- Type IV
    - Intended Use: Portable use in mobile industries and/or outdoor settings
    - Potential for Damage: Significant
    - Requirements: Minimum fill requirements, the means for mounting in a fixed position, corrosion and moisture resistance, impact resistance, meets ANSI Z308.1, section 5.2.5 requirements
    - Typical Applications: Transportation, utility industry, construction industry, armed forces

Table 1.05-3 ANSI Z308.1-2021 Characteristics of Types of Fist Aid Kits

Type	Use	Portable	Mountable	Water Resistant	Waterproof	Performance
I	Indoor	No	Yes	No	No	N/A
II	Indoor	Yes	No	No	No	N/A
III	Indoor/ Outdoor	Yes	Yes	Yes	No	N/A
IV	Indoor/ Outdoor	Yes	Yes	No	Yes	Meets ANSI Z308.1, section 5.2.5

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.06 Emergency Plans

1. Scope

This section establishes the requirements for emergency plans at all facilities owned, controlled, or occupied by the Bureau of Reclamation (Reclamation) with the exception of Reclamation-owned high- and significant- hazard dams. Emergency action plans for Reclamation-owned high- and significant- hazard dams must adhere to the requirements of Reclamation Manual Directive and Standard, Emergency Management Program for Water Impoundment Structures (FAC 01-01), which relates to the protection of communities downstream of Reclamation dams and urbanized canal reaches.

2. General Requirements

Reclamation's objective for emergency plans is to ensure employee and public safety, and protection of property during foreseeable emergency events. All emergency plans must comply with applicable standards and regulations in Occupational Safety and Health Administration (OSHA) 29 CFR 1910.38, Emergency Action Plans; National Fire Protection Association (NFPA) 101, Life Safety Code; and the Department of the Interior Departmental Manual, Series 41, Emergency Management, Part 900, Emergency Management Program. Emergency plans shall address initiating the Incident Command System (ICS) and the transition from initial emergency response to continuity of operations as required by Reclamation Manual Directive and Standard, Continuity of Operations (COOP) (SLE 08-02).

3. Responsibilities

a. Area/Facility Office Managers

- Shall appoint an Occupant Emergency Plan (OEP) Coordinator.

b. OEP Coordinators

- Shall develop a written OEP for the buildings where their employees work.
- Shall ensure training is conducted per the requirements in paragraph 1.06.4.
- Shall coordinate OEP drills, ensuring they occur at least once a year.

c. First-Line Supervisors

- Shall ensure personnel who report to them directly are trained on OEP per the requirements in paragraph 1.06.4.
- Shall ensure OEP training for personnel who report to them directly is documented per the requirements in paragraph 1.06.4.
- Shall account for personnel who report to them directly whenever the OEP is in effect.

d. Evacuation Teams

- Shall be trained in the OEP requirements.
- Shall assist in executing the OEP when it is in effect.

e. Employees

- Shall participate in and complete OEP training per the requirements in paragraph 1.06.4.
- Shall participate in OEP drills.
- Shall follow the OEP when it is activated.

f. Joint Host and Contract Employer

- Shall develop emergency plans and submit them to the contracting officer as part of the contractor's safety plan.

4. Training Requirements

a. Initial

- New Employees. New employees must be trained on their facility's OEP upon beginning employment.
- Current/Reassigned Employees. Current employees who are assigned to a new facility must be trained on that facility's OEP upon initial assignment.

b. Refresher/Recertification

All employees must be trained on their facility's OEP whenever it undergoes significant changes.

c. Recordkeeping

All training (including any retraining) must be documented in the Department of the Interior's designated learning database.

5. Hazard Identification, Assessment, and Safety Measures

OEP Coordinators must identify potential hazards arising from emergency responses (e.g., evacuation, shelter in place, etc.) and include hazard controls for them in the OEP. Appropriate hazard controls shall be identified according to the hierarchy of controls, which prioritizes hazard controls in order from most effective to least effective. The hazard controls in the hierarchy are:

- elimination,
- substitution,
- engineering controls,
- administrative controls, and
- personal protective equipment.

6. Hazardous Environmental Conditions (Weather/Other)

a. Weather Conditions

OEPs must account for the potential effects of bad weather on emergency procedures (e.g., evacuation routes, rally points, etc.) and include alternate sites and procedures to be used during inclement weather.

b. Fire Emergency Action Plans

Fire emergency action plans must adhere to the requirements of RSHS Section 1.09, Fire Prevention and Protection, paragraph 1.09.5.b, “Fire Emergency Action Plan.”

c. Hazardous Waste Emergency Plans

Hazardous waste emergency plans must adhere to the requirements of RSHS Section 1.16, Hazardous Materials Emergency Response.

7. Personal Protective Equipment (PPE)

Per paragraph 1.06.5, OEPs must include controls for potential hazards associated with emergency responses. PPE will be selected as a method of hazard control only if other hazard controls are deemed infeasible or do not provide adequate protection from hazard exposure See RSHS Section 1.07, Personal Protective Equipment.

8. Other Safety Equipment

OEPs must identify safety equipment used in evacuations, who is responsible for operating it, and any training requirements associated with its use. This includes but is not limited to equipment such as radios, evacuation chairs, high visibility vests, megaphones, etc.

9. Safe Practices

a. OEP Elements

The OEP must include the following elements:

- evacuation procedures, routes, and rally points,
- shelter-in-place procedures and locations,
- facility plan, unless restricted for security purposes,
- active shooter procedures,
- procedures for employee accountability following an emergency event,
- lines of authority for emergency procedures,
- training requirements for all persons assisting in emergency events,
- requirements for emergency equipment,

- identification of critical facility operations and procedures for those who remain behind to operate them before evacuation,
- assignment of rescue and medical duties,
- means of reporting emergencies, and
- communication systems and procedures.

b. Alert Systems for Emergency Situations

Alert systems are alarms or procedures designed to warn of existing or imminent emergency situations. Alert systems may also be designed to alert and summon emergency response personnel. Alert systems are required and must be designed and tested to ensure all persons likely to be affected by emergency situations including those with disabilities are familiar with the systems and will receive adequate warning to take the actions prescribed in the OEP.

c. Resuming Normal Operations

Normal operations may resume only after actions have been taken to ensure that safe conditions exist and/or have been restored. This must be determined by the OEP Coordinator in conjunction with the local manager. Do not jeopardize the safety of employees, the public, or contractors by resuming operations or restoring service before safe conditions have been reestablished and verified.

10. Communication Requirements

Conspicuously post emergency telephone numbers and reporting instructions for ambulance, medical, hospital, fire, and police services. Ensure telephone lines and radio frequencies are kept clear for use by those in charge during an emergency.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.07 Personal Protective Equipment

1. Scope

This section sets forth requirements for personal protective equipment (PPE), including workplace assessment, PPE maintenance, and training. This section applies to all Reclamation employees, contractors and visitors who select, purchase, or use PPE. Reclamation Safety and Health Standards (RSHS) Section 2.08, Respiratory Protection, details the requirements for respirator use. RSHS Section 1.13, Fall Protection, details PPE requirements for activities requiring fall protection.

2. General Requirements

Reclamation's objective is to eliminate or minimize exposure to hazards. The primary tool Reclamation uses to do this is the hierarchy of controls, which prioritizes hazard controls in order from most effective to least effective. The hazard controls in the hierarchy are:

- elimination,
- substitution,
- engineering controls,
- administrative controls, and
- PPE.

Since PPE is the least effective method of hazard control and mitigates the least amount of risk, it must be used in conjunction with other, more effective means of hazard control whenever feasible. All other means of controlling a hazard must be considered and determined infeasible before PPE is selected as the sole primary hazard control.

3. Responsibilities

a. First-Line Supervisors

- Ensure that the workplace assessment is completed and that employees have the PPE and associated training to perform work safely.
- Review and sign Job Hazard Analyses (JHAs) for their employees, ensuring the JHA identifies the PPE needed to mitigate the hazards of the job.

b. On-Site Job Leads

- Inspect PPE before use.
- Verify that employees using PPE have been trained in its proper use.
- Ensure the PPE identified in the JHA is used.

c. People Doing the Work

- Shall attend annual training for all PPE that is required by Occupational Safety and Health Administration (OSHA) regulations.
- Shall inspect PPE before use.
- Correctly put on, use, and take off PPE as instructed in training.
- Maintain and store PPE in accordance with the manufacturer instructions.

d. Regional Safety Manager

- Assist facilities in the region with technical questions related to PPE, including sharing technical advancements and best practices.

e. Project Manager/Acquisitions

- Support acquisitions of PPE that meets or exceeds the safety requirements of the job as identified in the JHA.

f. Joint Host and Contract Employer

- Follow Reclamation PPE safety requirements, as specified in the contract. These include the requirements of this RSHS section, and all PPE requirements found in other RSHS sections.

4. Training Requirements

Employees shall be trained in the use, care, and limitations of all required PPE.

a. Training

- Initial. Employees must be trained in and demonstrate an understanding of the following aspects of PPE before use: selection (for the specific hazard); correctly putting on, adjusting, and taking off the equipment; limitations and useful life; inspection and testing; and proper care, including maintenance, storage, and disposal.
- Refresher/Recertification. The supervisor shall coordinate training for their employees when there is an annual OSHA training requirement (e.g., for respirators and hearing protection) and retrain an employee when there is reason to believe that the employee does not have the understanding and skill to use the furnished PPE properly.
- Recordkeeping. Reclamation managers/supervisors are responsible for ensuring all training (including any retraining) for PPE is documented in the agency system of tracking training.

5. Hazard Identification, Assessment, and Safety Measures

a. Workplace Assessment

Supervisors will assess each workplace to determine if hazards are present or are likely to become present. Appropriate control measures must be implemented through the hierarchy of

controls to reduce the hazard to an acceptable level of risk. When controlling workplace hazards, using PPE is the last option to address hazards; first consider if there are better ways to mitigate them. Selection of PPE will be based on the actual worksite conditions, especially the anticipated frequency and duration of exposure to identified hazards.

b. Documentation

Document the workplace assessment in writing as outlined in Section 1.04, Work Planning. Workplace assessments identify the hazards of the general workplace, workforce, and environment (whereas the JHA identifies hazards associated with each step or task of a specific job and develops solutions that will eliminate, mitigate, or prevent such hazards).

c. Compliance Guidelines

Follow the compliance guidelines for hazard assessment and PPE selection found in 29 CFR 1910, Subpart I, Appendix B.

6. Pre-job Briefing and Planning Requirements

Prior to starting work, employees must be briefed on the known safety hazards present in the work area. Job tasks with known and assumed risks must have an existing JHA readily available that identifies PPE used to mitigate hazards. Employees and supervisors must review the JHA prior to performing work and confirm that the PPE identified in the JHA is appropriate and available for use.

7. Hazardous Environmental Conditions (Weather/Other)

Whenever possible, schedule outdoor work for a time that will minimize exposure to inclement weather. When this is not possible, ensure the JHA includes controls to mitigate weather conditions, including PPE designed for outdoor use.

8. Personal Protective Equipment

PPE is clothing, headwear, eyewear, footwear, or other garments or equipment designed to protect the wearer's body from injury or illness. PPE can lessen physical, electrical, thermal, chemical, biological, radiological, and airborne particulate hazards. PPE is provided to employees by Reclamation; it is not part of the ordinary and usual clothing (e.g., long pants, warm clothing in winter, etc.) an employee may reasonably be expected to provide for himself or herself.

a. PPE Selection and Use

Appropriate PPE will be identified and selected according to the hazards identified in the workplace assessment or noted on the safety data sheet (SDS) and JHA. Employees are required to use approved PPE and safety equipment determined by their supervisor in coordination with a safety and health professional to provide acceptable levels of protection.

The supervisor and safety professional will consult with the employee(s) in selecting PPE, and employees are required to wear/use selected PPE to provide that appropriate level of protection. The selection and purchase of PPE must be approved by the supervisor in writing, documented on form 7-2687, and attached to the purchase card statement.

b. PPE Maintenance

Inspect PPE before each use. Maintain and store PPE per manufacturer recommendations. As appropriate, clean and sanitize PPE after each use. Defective or damaged PPE that has exceeded its useful life shall not be used and shall be tagged as out of service and/or immediately removed from the work site to prevent its use.

c. Visitor Protection

Inform visiting workers and visitors of the existing hazards in an area before planned visits or before permitting entrance to the area. Whenever possible, keep visitors away from hazard areas and limit access to designated routes. Document visitor hazards with a JHA or hazard assessment of the work area and communicate with visiting workers or visitors prior to the on-site visit to explain what PPE will be required, what PPE can be provided locally, and what PPE the visiting worker/visitor will need to bring.

9. Other Safety Equipment

Other sections of the RSHS cover other protective equipment not included in this section such as fall protection, fire and rescue devices, first aid and medical facilities, seatbelts, respiratory protection, and special devices and equipment for protecting employees from specific hazards. Employees, contractors and visitors will consult this section and all other RSHS sections relevant to the work being performed and use all specified protective equipment required for exposure to the hazards of the work.

10. Safe Practices

a. Head Protection

- Required Head Protection. Head protection is required when the work area or tasks include risk of head trauma from falling objects, sparks, or impact or collision with hazards. Head protection must be selected according to the anticipated hazards of the job and worksite. For example, a hard hat is appropriate on a construction site where overhead hazards are common, whereas a climbing helmet is appropriate for a job where side impacts are more likely than overhead impacts. All personnel, including contractors and visitors, will wear hard hats when entering or working in hard hat areas as designated by a hazard assessment or JHA.
- Hard Hat Areas. Hard hat areas include all areas where a person may suffer head trauma from overhead materials, objects, or equipment, or from striking against any other hazards. Hard hat areas also include areas where any kind of construction,

maintenance, or repair work is being performed, unless exempted by the JHA process or the facility's site safety plan.

- Posting of Hard Hat Areas. Conspicuous signs must be posted at all entrances to hard hat areas and in any location where visual information about required PPE is present.
- Head Protection Type and Class. For industrial and construction worksites, verify that hard hats comply with Type I or Type II, Class C, G, E requirements, as specified in American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) Z89.1, Industrial Head Protection. Hard hats will be appropriate for environmental hazards, such as heat and cold or chemical hazards. Hard hats worn by linemen, electricians, or employees working in tunnels, in shafts, or near high-voltage conductors or apparatus shall conform to Class E requirements of ANSI/ISEA Z89.1. Hard hats and helmets must have a manufacturer's label indicating that the design complies with ANSI requirements.
- Care and Use. No modification to the shell or suspension of head protection is allowed. No ball caps, knit caps, or other head dressing that could interfere with the fit or stability of the head protection will be worn under the head protection. Accessories specifically designed to be used in conjunction with hard hats and helmets are permitted. Hard hats and components will be visually inspected daily in accordance with the manufacturer's instructions for identifying signs of damage that might reduce the hat's safety integrity. Hard hats will be periodically inspected for ozone or ultraviolet degradation as evidenced by cracking or flaking. Hard hats will be replaced according to the recommendations of the manufacturer.

b. Eye and Face Protection

Employees exposed to potential eye or face injury from impact, trauma, foreign bodies, heat, sparks, intense visible light, intense ultraviolet light, or laser light will be furnished and required to wear eye and/or face protection specifically designed for the exposure.

- Design. Eye and face protection required by this subsection will comply with the standards published in the current ANSI/ISEA Z87.1, Occupational and Educational Personal Eye and Face Protection Devices.
- Safety Glasses. Safety glasses are protective devices intended to shield the wearer's eyes from a variety of hazards. While they may be used alone for protection, they are often used in conjunction with other protectors. Both the frames and the lenses (either plano or prescription) will meet the requirements of ANSI/ISEA Z87.1. Only the frames must be marked with the +Z87 logo to indicate compliance with the standard. All safety glasses will have side shields or be of a wraparound style when there is a hazard from flying objects. See paragraph 1.07.10.n.5, "Eye Protection," for additional requirements for electric arc flash protection, as well as paragraph 1.07.10.n.3, "Prohibited Articles," for electrical hazard prohibitions.

- Corrective Lenses. When employees who wear corrective lenses are required to wear eye protection, provide them with one of the following:
- safety glasses with lenses that provide optical correction to the employee's prescription,
- protective goggles or plano safety glasses that can be worn over corrective glasses, and
- goggles that incorporate corrective lenses mounted behind protective lenses.
- Selection Guide. When selecting eye and face protection for specific hazards and operations, refer to the requirements in Tables 1.07-1, 1.07-2, and 1.07-3.

TABLES 1.07-1 Eye and Face Protector Selection Guide

1.07-1.1 GENERAL

Hazards	Protectors	Limitations	Markings
Flying fragments, objects, large chips, particles, sand, dirt, etc. Hot Sparks	• Safety glasses with side shields • Goggles with direct or indirect ventilation • Face shield worn over safety glasses or goggles • Welding helmet • Safety glasses with side • Shields • Goggles with direct or indirect ventilation • Face shield worn over safety glasses or goggles • Full-face respirator • Loose-fitting respirator worn over safety glasses	• Protective devices with metal frames used in electrical hazard areas could potentially cause electrical shock, electrical burns, or thermal burns via electrical energy, including through radiation from accidental arcs. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated. • Safety glasses and cup- and cover- type goggles do not provide unlimited facial protection. Operations involving heat may also involve optical radiation. Protection from both hazards will be provided. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	Impact rated + (safety lens) Z87+ (all other lenses) Z87+ (plano frame) Z87-2+ (Rx frame)

1.07-1.2 HEAT—Furnace Operations, Gas Cutting, and Welding

Hazards	Protectors	Limitations	Markings
Splash from molten metals	• Face shield worn over safety glasses or goggles • Full-face respirator • Loose-fitting respirator worn over safety glasses	• Safety glasses and cup- and cover-type goggles do not provide unlimited facial protection. Operations involving heat may also involve optical radiation. Protection from both hazards will be provided. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	
High temperature exposure	• Screen face shield worn over safety glasses or goggles • Reflective face shield worn over safety glasses or goggles	• Safety glasses and cup- and cover-type goggles do not provide unlimited facial protection. Operations involving heat may also involve optical radiation. Protection from both hazards will be provided. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	

1.07-1.3 OPTICAL RADIATION

Hazards	Protectors	Limitations	Markings
Welding: electrical arc	• Welding helmet over safety glasses or goggles • Hand-held shield over safety glasses or goggles (for inspectors and observers)	• Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance. Filter lens shade for this type of work is typically from 10 to 14. Filter lenses must meet the requirements for shade designations in Table 1.07-2. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	• Welding: W shade number • UV: U scale number • Glare: L scale number • IR: R scale number • Variable tint: V • Special purpose: S
Welding: gas	• Welding helmet over safety glasses or goggles • Welding goggles • Welding face shield over safety glasses or goggles	• Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance. Filter lens shade for this type of work is typically from 4 to 8. • Filter lenses must meet the requirements for shade designations in Table 1.07-2. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	• Welding: W shade number • UV: U scale number • Glare: L scale number • IR: R scale number • Variable tint: V • Special purpose: S

Hazards	Protectors	Limitations	Markings
Cutting	• Welding helmet over safety glasses or goggles • Welding goggles • Welding face shield over safety glasses or goggles • Welding respirator	• Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance. Filter lens shade for this type of work is typically from 3 to 6. • Filter lenses must meet the requirements for shade designations in Table 1.07-2. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	• Welding: W shade number • UV: U scale number • Glare: L scale number • IR: R scale number • Variable tint: V • Special purpose: S
Torch brazing	• Welding helmet over safety glasses or goggles • Welding goggles • Welding face shield over safety glasses or goggles	• Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate task performance. Filter lens shade for this type of work is typically from 3 to 4. • Filter lenses must meet the requirements for shade designations in Table 1.07-2. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	• Welding: W shade number • UV: U scale number • Glare: L scale number • IR: R scale number • Variable tint: V • Special purpose: S
Torch soldering	• Safety glasses • Welding face shield over safety glasses	• Protection from optical radiation is directly related to filter lens density. Select the darkest shade that	

Hazards	Protectors	Limitations	Markings
	• Welding respirator	allows adequate task performance. Filter lens shade for this type of work is typically from 1.5 to 3. • Filter lenses must meet the requirements for shade designations in Table 1.07-2. • Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	
Glare	• Safety glasses with or without shields • Face shield over safety glasses or goggles	• Face shields alone do not provide adequate eye protection and must be used in tandem with safety glasses or goggles that are impact rated.	

Source: ANSI/ISEA Z84.1, 2010, Annex I

TABLES 1.07-2 Filter Lenses for Protecting Against Radiant Energy, Gas Welding and Oxygen Cutting

1.07-2.1 GAS WELDING

Operation	Plate Thickness	Recommended Shade Number	Minimum Required Shade Number[1]
Light	<1/8 in. / 3.2 mm	4-5	4
Medium	1/8-1/2 in. / 3.2-12.7 mm	5-6	5
Heavy	>1/2 in. / 12.7 mm	6-8	6

1.07-2.2 OXYGEN CUTTING

Operation	Plate Thickness	Recommended Shade Number	Minimum Required Shade Number[1]
Light	<1 in. / 25 mm	3-4	3
Medium	1-6 in. / 25-150 mm	4-5	4

Source: 29 CFR 1910.133(a)(5)

The minimum shade for filter lenses is a baseline requirement—use a darker shade if possible. As a rule, start with a shade that is too dark to see the weld zone and then reduce the shade by one until the shade allows sufficient view of the weld zone without falling below the minimum requirement. In oxyfuel gas welding or cutting where the torch or flux produces a high yellow light, use a filter lens that absorbs the yellow or sodium line in the visible light of the operation.

[1] The minimum shade for filter lenses is a baseline requirement—use a darker shade if possible. As a rule, start with a shade that is too dark to see the weld zone and then reduce the shade by one until the shade allows sufficient view of the weld zone without falling below the minimum requirement. In oxyfuel gas welding or cutting where the torch or flux produces a high yellow light, use a filter lens that absorbs the yellow or sodium line in the visible light of the operation.

TABLES 1.07-3 Filter Lenses for Protecting Against Radiant Energy, Other Operations

1.07-3.1 OPERATION—Shield Metal Arc Welding (SMAW)

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
<3/32 in. / 2.4 mm	<60	7	7
3/32-5/32 in / 2.4-4.0 mm	60-160	10	8
5/32-1/4 in. / 4.0-6.4 mm	160-250	12	10
>1/4 in. / 6.4 mm	250-550	14	11

1.07-3.2 OPERATION—Gas Metal Arc Welding and Flux-cored Arc Welding (GMAW/FCAW)

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
-	<60	7	7
-	60-160	11	10
-	160-250	12	10
-	250-550	14	10

1.07-3.3 OPERATION—Gas Tungsten Arc Welding (GTAW)

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
-	<50	10	8
-	50-150	12	8
-	150-500	14	10

1.07-3.4 OPERATION—Air Carbon Arc Cutting

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
Light	<500	12	10
Heavy	500-1000	14	11

1.07-3.5 OPERATION—Plasma Arc Welding (PAW)

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
-	<20	6-8	6
-	20-100	10	8
-	100-400	12	10
-	400-800	14	11

1.07-3.6 OPERATION—Plasma Arc Cutting

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
Light[2]	<300	9	8
Medium[2]	300-400	12	9
Heavy[2]	400-800	14	10

[2] These values apply when the actual arc is clearly seen. Lighter filters may be used when the arc is hidden by the work piece.

1.07-3.7 OPERATION—Torch Brazing

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
-	-	3-4	3

1.07-3.8 OPERATION—Torch Soldering

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
-	-	2	2

1.07-3.9 OPERATION—Carbon Arc Welding (CAW)

Electrode Size	Arc Current (amperes)	Recommended Shade Number	Minimum Required Shade Number[1]
-	-	14	14

Source: 29 CFR 1910.133(a)(5)

c. Welding Protection

Employees engaged in welding, gouging, cutting, or burning operations will wear protective equipment to prevent skin and clothing from physically contacting sparks, slag, heat, and flame. Employees engaged in these types of operations will wear flame resistant (FR) or leather gauntlet gloves and chrome-tanned leather or equivalent FR chaps and coats, or another combination of protective equipment that provides equal protection to prevent exposure to heat, sparks, slag, and intense visible and ultraviolet light generated during welding operations. Employees will wear FR or leather gloves and aprons when performing cutting, burning, gauging, plasma arc, and torch operations.

- Electric Welding. Employees will wear nonflammable welding helmets with lift- front or stationary-front lenses when engaged in electric welding operations. Employees will wear plano or prescription safety glasses or flash goggles under the helmet to protect their eyes when raising the helmet. Helmet filter lens shades will conform to Tables 1.07-2 and 1.07-3. If auto darkening filters are incorporated into the helmet, the variable filter shade range will be marked on it as required in Table 1.07-2. Auto darkening helmets must include a special filter that blocks harmful radiation even if the main switching

element fails and shall meet ANSI/ISEA Z87.1 requirements for impact protection and switching index time.

- Gas-Torch Cutting and Welding. When gas-torch cutting and welding, employees will wear eye protection with filter lenses that conform to the requirements in Tables 1.07-1, 1.07-2, and 1.07-3. Sunglasses do not meet this requirement.
- Welder Helper or Inspector. Welder helpers or welding inspectors will wear flash goggles with a minimum lens shade of 2 in the general welding area. Helpers or inspectors observing actual welding operations will wear the same protection as the welder.

d. Laser Protection

Install and use lasers and laser systems according to the manufacturer's requirements and the restrictions in ANSI/LIA Z136.1, Safe Use of Lasers. Employees whose work involves Class 3b or Class 4 laser beams will wear appropriate laser safety goggles.

e. Hearing Protection

- Control of Noise Exposure. Practical engineering or administrative controls must be considered and applied when personnel are subject to sound pressure levels exceeding the limits specified in RSHS Section 2.07, Hearing Loss Prevention Program. When such controls alone are not sufficient to reduce sound pressure levels to within the specified limit, PPE will be selected, evaluated, and used in accordance with a hearing loss prevention program as specified in RSHS Section 2.07, Hearing Loss Prevention Program.
- Hearing Protection Devices. Use hearing protection devices (properly inserted ear plugs or earmuffs) whenever noise levels equal or exceed 82 decibels, A scale (dBA) based on a 3 dB exchange rate. Provided hearing protection must reduce employee noise exposure below an 8-hour time-weighted average of 85 dBA. See Section 2.07, Hearing Loss Prevention Program, for additional selection and care instructions.
- Hearing Device Labels. Use hearing protection devices labeled by the manufacturer in accordance with 40 CFR 211, Product Noise Labeling. Supervisors will verify that only appropriate hearing protection devices are used.

f. High Visibility Clothing

- Performance Class 1. Performance Class 1 apparel will be used when traffic speeds are less than 25 miles per hour, traffic is well separated from employees, and work tasks permit undivided attention to approaching traffic. Some examples of employees that may appropriately use Performance Class 1 apparel are parking lot attendees, delivery drivers, and sidewalk construction employees. Retroreflective material must cover at least 155 square inches.
- Performance Class 2. Performance Class 2 apparel will be used when traffic speeds exceed 25 miles per hour, work tasks divert employee attention from traffic, or employees are not well separated from traffic. Construction activities fall into this

category. Some examples of employees that may appropriately use Performance Class 2 apparel are survey crews, road construction crews, utility workers, and construction workers working around heavy equipment. Retroreflective material must cover at least 201 square inches.

- Performance Class 3. Performance Class 3 apparel will be used when employees are exposed to traffic speeds that exceed 50 miles per hour or anytime visibility from a greater distance is needed. Some examples of employees that may appropriately use Performance Class 3 apparel are highway construction crews, flag crews, and survey crews. Retroreflective material must cover at least 310 square inches. A sleeveless garment or vest alone will not be considered Performance Class 3, regardless of the area covered by retroreflective material.

g. Chemical Protective Clothing

Chemical protective equipment will be selected that is resistant to all of the chemicals present in the products being used. Protective clothing selected will be of the disposable, single-use type, or else provisions will be made to launder protective clothing to prevent removal of contaminants from the site.

h. Gloves

Select hand protection on the basis of the workplace assessment. Gloves will be provided by Reclamation and used by employees to prevent contact with biological, chemical, and physical hazards, including vibration. Substances from which employees may require protection include acids, caustics, solvents, herbicides, infectious materials, and other toxic materials. Employees will wear leather-palm gloves or equivalent cut-resistant gloves when working with steel cables, barbed wire, rough-sawn timber, or other materials capable of causing lacerations. Employees will wear insulating gloves when handling materials of extreme temperatures.

i. Rubber Insulating Goods

When required by special conditions, employees will use rubber gloves, sleeves, blankets, covers, and line hose for work on energized equipment and conductors to protect from the danger of electric shock. Rubber insulating goods will meet American Society of Testing and Materials (ASTM) standard specifications as shown in Table 1.07-4 Documented inspections will be performed as specified in Table 1.07-4, and a visual inspection will be conducted prior to each use.

TABLE 1.07-4 Standards for Rubber Insulating Goods

Equipment	When to test	Standards	Standard for testing
Gloves	Before first issue and every 6 months thereafter	ASTM D120, Standard Specification for Rubber Insulating Gloves	ASTM F496, Standard Specification for In-Service Care of Insulating Gloves and Sleeves
Sleeves	Before first issue and every 12 months thereafter	ASTM D1051, Standard Specification for Rubber Insulating Sleeves	ASTM F496, Standard Specification for In-Service Care of Insulating Gloves and Sleeves
Blankets	Before first issue and every 12 months thereafter	ASTM D1048, Standard Specification for Rubber Insulating Blankets	ASTM F479, Standard Specification for In-Service Care of Insulating Blankets
Covers	If insulating value is suspect and after repair	ASTM D1049, Standard Specification for Rubber Insulating Covers	ASTM F478, Standard Specification for In-Service Care of Insulating Line Hose and Covers
Line hoses	If insulating value is suspect and after repair	ASTM D1050, Standard Specification for Rubber Insulating Line Hose	ASTM F478, Standard Specification for In-Service Care of Insulating Line Hose and Covers
Mats	-	ASTM D178, Standard Specification for Rubber Insulating Matting	-

j. Protective Chaps

Employees who operate chain saws will wear protective chaps that meet ASTM F1897, Standard Specification for Leg Protection for Chain Saw Users, and ASTM F1414, Standard Test Method for Measurement of Cut Resistance to Chainsaw in Lower Body (Legs) Protective Clothing.

k. Foot Protection

Select footwear on the basis of a foot hazard assessment. When work endangers feet or requires special foot protection, employees will wear protective footwear that meets the requirements in ASTM F2413, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear. All footwear will meet the basic I/75 impact and C/75 compression standards for the protective toe box. In addition, rubber footwear, including boots and packs, will meet the sole puncture-resistance requirements. Heavy-duty footwear will meet the MT/75 metatarsal requirements. Footwear with metatarsal guards provides protection to the

metatarsal area of the foot that the safety toe box does not provide. Activities where heavy objects are lifted or where the foot could be crushed by rolling hazards require footwear with metatarsal protection. Employees exposed to energized electrical parts will have boots that are electrically rated “EH” for “electrical hazards.” Examples of work environments that require protective footwear include construction sites, industrial areas including powerplants, warehouses, and underground work areas.

l. Minimum Work Apparel

All employees who work outdoors will wear, at a minimum, long pants and shirts with a minimum 4-inch sleeve to protect themselves from environmental and physical hazards, unless other apparel is approved by a first-line supervisor in coordination with the appropriate safety and health professional(s). Short pants, cutoffs, tank tops, or modified shirts are not acceptable. Open-toed shoes are not appropriate outside of an administrative environment. Apparel will protect areas where biological or chemical irritants could touch the skin. Minimum wearing apparel is to be furnished by the employee.

m. Apparel Necessitated by Environmental Conditions

Extreme weather conditions (e.g., excessive hot, cold, wet, or windy conditions), a caustic or toxic environment, or biological hazards may necessitate additional protection for the employee beyond what would normally be expected for the routine aspects of the job. A JHA will be conducted to analyze the hazards and to select the appropriate control methods. For chemical hazards, the SDS as well as other information provided in this section will be used for selecting the appropriate employee protection. See RSHS Section 2.06, Health Hazard Assessments, for additional requirements on hot and cold environments.

n. Arc Flash Protection

As stated in Facilities Instructions, Standards, and Techniques (FIST) Volume 5-14, Electrical Safety Program, any person who enters the arc flash protection boundary for an item of electrical equipment will wear appropriate PPE. The arc flash protection boundary is the distance from exposed live electrical parts within which a person could receive a second-degree burn if an electrical arc flash were to occur. The arc flash protection boundary is determined by an incident energy analysis or, if deemed appropriate by a qualified engineer, by a task-based assessment. An incident energy analysis will calculate the flash protection boundary for each item of electrical equipment in a facility that is 50 volts or greater. The task-based assessment may be used as an interim step at all facilities until a detailed incident energy analysis is completed. All parts of the body inside the arc flash protection boundary will be protected. Clothing must meet ASTM 1506 Standard Performance Specification for Flame Resistant and Electric Arc Rated Protective Clothing Worn by Workers Exposed to Flames and Electric Arcs and must be laundered consistent with manufacturer recommendations.

- Determination of Appropriate Clothing. When it has been determined that work will be performed within the arc flash protection boundary, one of the following methods will be used for selecting protective clothing and other PPE to adequately protect the employee.

    - Incident Energy Analysis. An incident energy analysis will be performed to document the incident energy exposure to the employee (in calories per square centimeter [cal/cm2]). The incident energy exposure level will be specific to the task to be performed and will be based on the working distance of the employee's face and chest area from a potential arc source. Arc-rated clothing and other PPE will be selected according to the incident energy exposure associated with the specific task. Additional PPE shall be used for any parts of the body that are closer to the potential arc source than the distance used to calculate the incident energy.
    - Hazard/Risk Categories. The requirements in the latest National Fire Protection Association (NFPA) 70E, Standard for Electrical Safety in the Workplace, paragraphs 130.7(C)(15) and 130.7(C)(16), shall be used for selecting and using personal and other protective equipment. Tables 130.7(C)(15)(a) and 130.7(C)(15)(b) shall be used to determine the hazard/risk category and requirements for using rubber insulating gloves and insulated and insulating hand tools for a task. The assumed maximum short-circuit current capacities and maximum fault clearing times for various tasks are listed in Table 130.7(C)(15)(a). For tasks not listed, or for power systems with greater than the assumed maximum short-circuit current capacity or with longer than the assumed maximum fault clearing times, an incident energy analysis shall be required, in accordance with Table 130.5. Once the hazard/risk category has been identified from Tables 130.7(C)(15)(a) and 130.7(C)(15)(b) (including associated notes), as well as the requirements of Table 130.7(C)(15), Table 130.7(C)(16) shall be used to determine the required PPE for the task. Table 130.7(C)(15)(c) lists the requirements for protective clothing and other protective equipment based on hazard/risk categories 1 through 4. This clothing and equipment shall be used when working within the arc flash boundary.

- Synthetic Clothing Not Permitted. Do not wear synthetic fabrics such as acetate, acrylic, nylon, polyester, polyethylene, polypropylene, or spandex in clothing underlayers. These materials can melt into the skin when exposed to high temperatures and can aggravate a burn injury. An incidental amount of elastic used on non-melting fabric underwear or socks is permitted.
- Prohibited Articles. Do not wear conductive articles of jewelry and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal-frame glasses) when they can present an electrical contact hazard with live parts or when within the restricted approach boundary.
- Head, Face, Neck, and Chin Protection. Employees will wear nonconductive, arc-rated head protection that meets Class E or Class G specifications of ANSI/ISEA Z89.1,

Industrial Head Protection, and nonconductive PPE for the face, neck, and chin whenever there is a danger of injury from electric shock, burns, arcs, or flashes or from flying objects resulting from electrical explosion. If employees use hair nets and/or beard nets, these items must be arc-rated.

- Eye Protection. Employees will wear protective eyewear whenever there is a danger of injury from electrical arcs or flashes or from flying objects resulting from electrical explosion. If the worker's head is within the arc flash boundary, the worker's eyes must be protected from the thermal hazard as well. Always wear eye protection (safety glasses or goggles) under face shields or hoods. The face shield must have an arc rating at least as great as the predicted incident energy or PPE category.
- Hearing Protection. Hearing protection will be worn when an employee is within the arc flash boundary to protect against the high noise potential from an electrical arc blast.
- Body Protection. When the calculated incident energy is below 1.2 cal/cm2, all clothing must be non-melting or untreated natural fiber clothing (refer to section 1.04.10.n.(2), "Synthetic Clothing Not Permitted". Flash suits will be designed to permit easy and rapid removal. Garments, such as rain gear, worn as an outer layer over arc-rated clothing will also be made of arc-rated materials. The entire flash suit, including the arc hood and face shield, will have energy-absorbing characteristics suitable for arc-flash exposure.
- Hand and Arm Protection. Employees will wear rubber insulating gloves whenever there is a danger of hand and arm injury from electrical shock and burns because of contact with energized parts. Wear hand and arm protection when the possibility of arc flash burn exists. Gloves made from layers of arc-rated material provide the highest level of hand protection against arc flash. Heavy-duty leather gloves also provide good protection. When voltage-rated gloves are used, wear leather protectors over the rubber gloves.
- Foot Protection. Heavy-duty leather work shoes provide a significant degree of protection for the feet from arc flash. Shoes made from lightweight material will not be selected.

o. Protection Against Drowning

Provide U.S. Coast Guard (USCG)–approved, wearable personal flotation devices (PFDs) to employees when they are working on or around water that presents a drowning hazard. Employees will wear the provided devices as directed by the manufacturer's instructions (i.e., properly zipped, tied, latched, etc.). When USCG-approved auto-inflating PFDs are selected, they must be carefully inspected before each use to ensure that the inflator mechanism is armed and in good condition. The bladder must not leak, and the user must be familiar with its use and operation. An auto-inflatable PFD must be worn as the outermost layer.

- Design. The PFD will be of a highly visible color and will have at least 31 square inches (200 square centimeters) of retroreflective material attached to both the front and the

back. If the PFD is reversible, retroreflective material will be attached to each of its reversible sides.

- Inspection and Replacement. Before each use, visually inspect each PFD for defects that would compromise its strength or buoyancy. Check the PFD for rips, tears, sun damage, and holes, and ensure that seams and fabric straps are in satisfactory condition. There must be no signs of waterlogging, mildew, or shrinkage of the buoyant materials. Metal or plastic hardware used to secure the PFD on the wearer must not be broken, deformed, or weakened by corrosion. Webbing or straps used to secure the PFD on the wearer must not be ripped, torn, or separated from an attachment point on the PFD. If any of the aforementioned defects or other defects identified in the manufacturer's instructions are found, do not use the PFD; replace it immediately.
- Areas of Use. PFDs shall be worn whenever there is a drowning hazard. This includes work on boats (unless in an enclosed cabin), rafts, floating pipelines, or stages and wading in streams/water that is waist deep or higher. PFDs shall be worn on structures or equipment next to or extending over water, except where guard rails, personal fall protection systems, or safety nets are provided for employees.
- Ring Buoys. Install USCG-approved ring buoys with at least 90 feet of line at 200- foot intervals along worksites where a drowning hazard exists. On an annual basis, visually inspect and document each ring buoy and rope for defects that would compromise their strength or buoyancy and replace them immediately as needed.
- Life Saving Skiffs. Provide one or more lifesaving boats or skiffs where employees work over or immediately adjacent to water, if determined necessary by a JHA. Persons trained in launching and operating the skiff must be immediately available during working hours. Use the skiff only for drills and in emergencies. Lifesaving skiffs will have the following equipment on board:

    - four oars (or two oars if the skiff is motor powered),
    - oarlocks attached to the gunwales or to the oars,
    - one ball-pointed boat hook,
    - at least one ring buoy with 90 feet of line attached,
    - one life preserver or work vest for each crew member, and additional devices for rescued persons, and
    - emergency lighting.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.08 Signs, Signals, and Barricades

1. Scope

This section establishes requirements for the design, application, and use of signs, signals, and barricades; as well as specific tags and labels to indicate specific hazards which could harm workers, the public, or cause property damage. These requirements do not apply to bulletin boards or safety posters.

2. General Requirements

Signs, tags, signals, labels, and barricades shall be used to give warning and caution of hazards. These materials instruct and direct workers and the public. Warning systems shall be visible when the hazard or problem exists and removed or covered when it no longer exists.

3. Responsibilities

a. First-Line Supervisors

- Shall identify potential hazards or risk exposures which require signs, signals, and barricades.
- Shall ensure signs, signals, and barricades are in place and maintained in good working conditions.
- Shall ensure and track employee's completed training per paragraph 1.08.4.

b. Employees

- Shall complete required training programs per paragraph 1.08.4.
- Shall install signs, signals, and barricades per requirements of the Job Hazard Analysis (JHA) or work plan.
- Shall follow and obey the signs, signals, and barricades in the work area.
- Shall report any problems with signs, signals, and barricades to the supervisor.

4. Training Requirements

a. Initial

Employees shall be trained on the meaning and demonstrate an understanding of the correct use of various signs, signals, tags, labels, and barricades throughout the workplace and any special precautions which may be required.

b. Refresher

Additional employee training shall occur upon the following:

- changes in types of scaffolds, fall protection, falling object protection, aerial lift, or other equipment are implemented,

- changes in regulations pertaining to signs, signals, tags, labels, and barricades; and/or
- if the supervisor believes the employee lacks the necessary skill, understanding, or proficiency to work safely.

c. Recordkeeping

Reclamation training records shall be kept in the Department of the Interior official repository.

5. Pre-Job Briefing and Planning Requirements

Before starting work and while planning job tasks, employees shall be briefed on the JHA which identifies any signs, signals, tags, labels, and barricades to ensure they are appropriate for the identified hazard.

6. Safe Practices

a. Signage Guidance

- Posting. Required signs and signals shall be visible when work is performed and shall be removed or covered when the hazard no longer exists.
- Design and Application. The design and application of signs must conform to the latest edition of the following standards: American National Standards Institute (ANSI) Z535, Occupational Safety and Health Administration (OSHA) 1910.145 – Specifications for accident prevention signs and tags, OSHA 1926 Subpart G – Signs, Signals, and Barricades, and The American Society of Mechanical Engineer (ASME) A13.1, Scheme for Identification of Piping Systems.
- Appearance. Signs shall be furnished with rounded or blunt corners and shall be free from sharp edges, burrs, splinters, or other sharp projections. The ends or heads of bolts or another fastening device shall not constitute a hazard. The wording shall be easily read and concise and contain enough information to be easily understood.

b. General Safety Signs

- Purpose. Notices of general practice and rules relating to health, first aid, medical equipment, sanitation, housekeeping, and general safety.
- Design. Shall have a signal word in white on a green background in the upper panel and a lower panel for additional wording or symbols in black or green on a white background. Alternatively, the entire sign may be white letters on a blue background.

c. Information Signs

- Purpose. Provide information of a general nature, such as designation of facilities or services, to avoid confusion or misunderstanding.
- Design. Shall have the signal word "NOTICE" in white on a blue background in the upper panel; the lower panel shall be used for additional wording or symbols in blue or black on

a white background. Alternatively, the entire sign may be white letters on a blue background.

d. Danger Signs

- Purpose. Indicate an imminently hazardous situation that, if not avoided, will result in death or serious injury. Danger signs indicate a specific, immediate, and grave danger; a hazard capable of producing irreversible damage or injury; and prohibition against harmful activity.
- Design. Shall follow the specifications illustrated in Figure 1 to 13 of ANSI Z535.2-2011. Shall have the signal word “DANGER" in white letters at the top of the sign in a rectangular safety red background. The safety alert symbol shall be on the same horizontal level as the base of the letters of signal-word height equaling or exceeding the signal word height. Alternative OSHA or ANSI requirement calls for lettering to be black letters on a white background and the symbol/pictorial panel, if used, shall be square with black and safety red, or black and safety red symbol on a white background. Other approved danger signs shall have the message in white lettering on a red background.

e. Caution Signs

- Purpose. Indicate a potentially hazardous situation that, if not avoided, may result in a minor or moderate injury. It may be used to alert against unsafe practices which may result in property damage. Hazards may be the same as those associated with danger signs but have less significant consequences should an incident occur. Call attention to a specific potential hazard capable of resulting in severe, but not irreversible, injury or damage.
- Design. Shall have “CAUTION” in yellow on black background and lower panel for additional sign wording in black on a yellow background. Caution signs shall follow the specifications illustrated in Figure 1 to 13 of ANSI Z535.2-2011.

f. Warning Signs

Indicate a potentially hazardous situation that, if not avoided, could result in death or serious injury. The hazards may be similar to those associated with danger signs but are significantly less magnitude.

g. Exit Signs

- Purpose. Shall be posted to provide guidance to an exit or positioned so the follow-on exit sign is visible. Signs will indicate the direction of the exit with an arrow, or no arrow when exit path continues straight on.
- Design. When required, shall be lettered in legible red or green letters, not less than 6 inches high, on a white field; the principal stroke of the letter shall be at least 3/4-inch in width. Each exit sign must be illuminated to a surface value of at least five foot-candles (54 lux) by a reliable light source (not battery powered) and be distinctive in color. Self-

luminous or electroluminescent signs with a minimum luminance surface value of at least .06 footlamberts (0.21 cd/m2) are permitted.

h. Fire and Emergency Signs

- Purpose. Shall be used only to label or point to fire extinguishing equipment, fire escapes and exits, gas shutoff valves, sprinkler drains, and emergency procedures.
- Design. Shall have the signal word in white on a red background in the upper panel, with the lower panel used for additional sign wordings or symbols in red on a white background.

i. Safety Instruction Signs

Shall be white; the upper panel shall be green with white letters to convey the principal message. Additional wording shall be on the lower panel in black lettering.

j. Directional Signs

Shall be white; the upper panel shall have a black panel with a white directional symbol. Additional wording shall be on the lower panel in black lettering. This does not include automotive traffic signs.

k. Pipe Labels

Label pipes to identify hazardous materials according to ASME 13.1, Scheme or the Identification of Piping Systems, with directional arrows and label spacing at branches of joints (elbows, t-joints, etc.) and on each side of a wall. This requirement does not apply to permanent installation of piping for potable water, cooling water, or compressed air; these labels are addressed in Reclamation design standards. Tabs should be used for pipes less than ¾-inch diameter and should be hung from valves.

- Basic labeling requirements must include:
- arrows to indicate flow direction,
- pipe content using a legend that is brief, informative, pointed, and simple,
- color to identify the primary characteristic of the contents (Table 1.08-1); and
- visible and legible legend letters no less than ½ inch height (Figure 1.08-1 and Table 1.08-2).

TABLE 1.08-1 Designation of Colors for Piping Systems

Fluid Service	Background Color	Letter Color
Fire quenching fluids	Safety Red	White
Toxic and corrosive fluids	Safety Orange	Black
Flammable oxidizing fluids	Safety Yellow	Black
Combustible fluids	Safety Brown	White

Fluid Service	Background Color	Letter Color
Portable, cooling, boiler feed, and other water	Safety Green	White
Compressed air	Safety Blue	White

FIGURE 1.08-1 Pipe Label Legend for Piping System

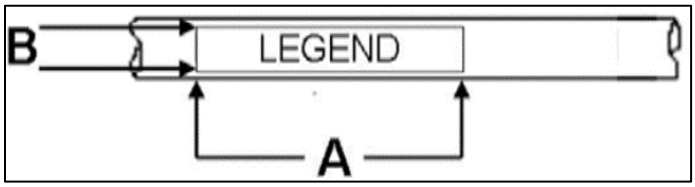


TABLE 1.08-2 Identification of Piping System

Outside Diameter of Pipe	Length of Color Field "A"	Size of Letter "B"
¾ to 1¼ inches	8 inches	½ inch
1½ to 2 inches	8 inches	¾ inch
2½ to 6 inches	12 inches	1¼ inches
8 to 10 inches	24 inches	2½ inches
Over 10 inches	32 inches	2½ inches

I. Temporary Traffic Control

- Federal Guidance. Shall be in accordance with the United States Department of Transportation Federal Highway Administration (FWHA) Manual on Uniform Traffic Control Devices (MUTCD) and shall be conducted in a manner as to offer the least possible obstruction to the safe and satisfactory movement of traffic over existing roads.
- Local Department of Transportation (DOT) Guidance. Barricades, warning signs, lights, temporary signals, other devices, flagger, and signal devices shall meet or exceed the minimum requirements of local DOT requirements.
- Construction Areas. Shall be posted with legible traffic control signs and protected by traffic control devices, at the point of hazard.
- Design. The design and use of all traffic control devices, including signs, signals, markings, barricades, and other devices for protection of employees shall conform to Part 6 of the MUTCD.
- Flaggers. Signaling by and the use of flaggers, including warning garments worn by flaggers, shall conform to Part 6 of the MUTCD.
- Barricades. Barricades for protection of employees shall conform to Part 6 of the MUTCD.

m. Accident Prevention Tags

- Use. Temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. (Figure 1.08-2, Table 1.08-3, and Table 1.08-4). They shall not be used in place of or as a substitute for locks, accident prevention signs, or special conditions tags as defined in Facilities Instructions, Standards & Techniques (FIST) 1-1, Hazardous Energy Control Program. For guidance on Lock out/Tag Out procedures, see Section 1.13, Control of Hazardous Energy (Lockout/Tagout).
- Specifications. Employers shall follow specifications in Figures 1 - 8 of ANSI Z535.5-2011, Safety Tags and Barricades Tapes (for Temporary Hazards).
- General. Employees shall be informed of the meaning of tags used throughout the workplace. Tags shall be affixed as close as safely possible to respective hazards by a positive means such as string, wire, or adhesive which prevents loss or unintentional removal.
- Other Tags. May be used in addition to those required by this section, or in other situations where this section does not require tags, if it does not detract from the impact or visibility of the signal word and major message of any required tag.

FIGURE 1.08-2 Accident Prevention Tag Legend

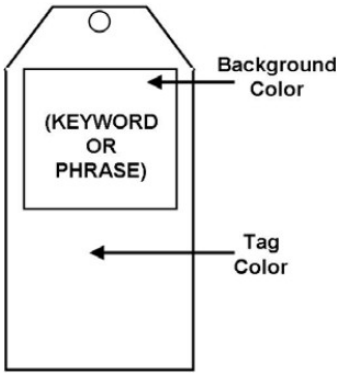


TABLE 1.08-3 Designation of Color for Accident Prevention Tags

Keyword/Phrase	Keyword/Phrase Print Color	Background Color	Tag Color
“DANGER”	White in red oval	Black	White
“CAUTION	Yellow	Black	Yellow
“DO NOT OPERATE”	White	Red	White
“OUT OF ORDER”	White	Black	White
“DO NOT USE”	White	Black	White
Informational message or inspection	Black or green	N/A	Green and white or White and black

TABLE 1.08-4 Accident Prevention Tag Color Coding

Tags Color	Purpose
Red	Used for identifying dangerous conditions, emergency controls, fire detection equipment and fire suppression systems, and containers of flammable liquids
Orange	Used for designating dangerous parts of machines and energized equipment. Shall be used for temporary traffic control signs in construction zones.
Yellow	Used for designating conditions required to caution and marking dangerous chemicals, physical hazards, and ionizing radiation.
Green	Used for designating safety equipment and operator devices and the location of first aid and safety equipment (other than firefighting equipment).
Blue	Used for designating information on a non-safety nature.
Purple	Used to designate ionizing radiation hazards.

n. Barrier Tape

- Requirement. Use to identify a temporary hazardous location. The employee in charge of the area must mark the tape with an accident prevention tag showing his/her name and phone extension.
- Red Plastic Tape. Use to warn of dangerous locations and means “STOP”, “DANGER”, or “DO NOT ENTER.” Instruct personnel working inside the taped area on requirements of the JHA. The employee in charge of the area must provide a proper briefing and approval for other personnel requiring entry. Personnel must not cross over or under a red barrier tape without proper authorization.
- Yellow Plastic Tape. Use to identify hazardous locations marking “CAUTION.” Using yellow plastic tape does not prevent employees from entering an area but does provide warning of a hazardous condition.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.09 Fire Prevention and Protection

1. Scope

This section establishes fire prevention and protection requirements for all Bureau of Reclamation- owned, controlled, or occupied facilities, construction sites, and mobile equipment. This section incorporates all the requirements of the Department of the Interior Departmental Manual, Series 27, Safety Management, Part 485, Safety and Occupational Health Program, Chapter 19, Fire Safety. Where this section does not provide specific instructions, it adopts, by reference, the current editions of Occupational Safety and Health Administration (OSHA) regulations, National Fire Protection Association (NFPA) codes and standards, and International Code Council (ICC) codes.

2. General Requirements

a. Planning

Reclamation facilities shall establish fire prevention, fire emergency action, and fire response plans to provide a safe work environment for our employees, contractors, and the public. These plans must also effectively protect the government's assets, Reclamation's operations, and the environment from the hazards created by fire, explosion, and events involving hazardous materials.

b. Minimum Criteria for Life Safety

Reclamation uses NFPA 101, Life Safety Code, and ICC International Fire Code (IFC) as the minimum criteria for life safety features in Reclamation-owned, controlled, or occupied facilities.

c. Maintenance

Any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, fire exposure control (e.g., grounds, outdoor storage, vegetation), or any other feature required for fire prevention and protection of Reclamation facilities shall be continuously maintained in an effective and working condition.

d. Testing and Inspections

Any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature required for fire prevention and protection of Reclamation facilities shall be tested, inspected, and operated as specified in this section.

3. Responsibilities

a. Area Office Managers

- Shall establish a fire prevention plan, emergency action plan, and fire response plan for each facility.

4. Training Requirements

a. Initial

- All Employees. Where required, employees shall be trained in the general principles of portable fire extinguisher use and the hazards associated with incipient- stage firefighting.
- Designated Employees. Employees designated to use portable fire extinguishers shall be trained in the general principles of portable fire extinguisher use, the hazards associated with incipient-stage firefighting, and the hands-on use of portable fire extinguishers.
- Fire Brigade. All fire brigade members shall receive training meeting the requirements of NFPA 600, Standard on Facility Fire Brigades, and OSHA 29 CFR 1910 Subpart L, Fire Protection.

b. Refresher/Recertification

- Portable Fire Extinguishers. All employees and designated employees shall receive annual portable fire extinguisher training.
- Fire Brigade. All fire brigade members shall receive refresher training meeting the schedule and requirements of NFPA 600 and OSHA 29 CFR 1910 Subpart L.
- Recordkeeping. All Reclamation training records shall be kept in the Department of the Interior official repository.

5. Pre-Job Briefing and Planning Requirements

a. Fire Prevention Plan

Each facility shall have a written fire prevention plan and it must be readily available for employees to review. The fire prevention plan must include:

- a list of all major workplace and mobile equipment fire hazards,
- an evaluation of the wildland fire exposure,
- the type of fire prevention and protection equipment necessary to control each major fire hazard,
- a list of potential ignition sources and procedures for controlling these sources,
- procedures for controlling accumulations of flammable and combustible waste materials and proper handling and storage of hazardous materials,
- procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials,
- if applicable, procedures for fire and security rounds by security or assigned personnel,
- assignments of responsibilities for maintaining the fire prevention and protection equipment that prevents or controls sources of ignition or fires and controlling fuel source hazards,

- procedures for regularly scheduled fire prevention and protection inspections, and
- procedures for informing new and existing employees assigned to the facility of the fire hazards to which they are exposed, and review parts of the fire prevention plan necessary for self-protection.

b. Fire Emergency Action Plan

Each facility shall have a written fire emergency action plan and it must be readily available for employees to review. The fire emergency action plan must include:

- an explanation of the alarm system used to notify employees of emergencies,
- assignment for points of contact who can provide employees more information about the plan or explain duties under the plan,
- procedures for reporting a fire or other fire-related emergency, emergency evacuation (e.g., type of evacuation and exit route assignments), accounting for all employees after evacuation, and employees performing rescue or medical duties,
- guidelines for training employees who will assist in a safe and orderly evacuation of other employees during a fire emergency, and
- procedures and a risk assessment for employees who remain behind to operate critical facility operations before evacuating.

    - Exercise. The fire emergency action plan must be exercised annually, at a minimum, by completing an evacuation drill.

c. Fire Response Plan

Each facility shall have a written fire response plan, and it must be readily available for employees to review. The fire response plan must include:

- the overall fire response plan for mobile equipment and strategy for the facility,
- a list of expected fire scenarios and the planned response to each,
- assignment of responsibilities for employee use of portable fire extinguishers,
- if applicable, the organizational statement for the facility fire brigade,
- if applicable, written local fire department coordination, and
- planned post-fire actions for returning the facility to normal operations.

d. Employee Review

The first-line supervisor must review the fire prevention plan, fire emergency action plan, and fire response plan with new employees upon assignment to the facility and with specific employees when their responsibilities under any of the plans change. Each of the plans must be reviewed with all employees whenever the plans are developed or changed, or at least every three years.

e. Contractors

When the contract requires the submittal of a safety plan, the contractor is responsible for developing a fire prevention plan, fire emergency action plan, and fire response plan that all meet the requirements in paragraphs 1.09.5.a, Fire Prevention Plan, 1.09.5.b, Fire Emergency Action Plan, and 1.09.5.c, Fire Response Plan, of this Reclamation Safety and Health Standard (RSHS). The plans must be submitted to the contracting officer as part of the contractor's safety plan per RSHS Section 1.03, Contractor Requirements. The contractor shall maintain all fire plans at the job site throughout all phases of the contractor's work. The contractor must review each of the plans with all contractor employees upon assigning them work at the job site.

6. Personal Protective Equipment (PPE) and Other Safety Equipment

a. Fire Brigades

Fire brigades shall be provided protective and firefighting equipment that meets the requirements of NFPA 600, NFPA 1977, Standard on Protective Clothing and Equipment for Wildland Fire Fighting, and OSHA 29 CFR 1910 Subpart L.

7. Safe Practices

a. Fire Suppression Systems

- Buildings and Equipment. Facility supervisors shall ensure competent employees install fire suppression systems in Reclamation facilities and on Reclamation equipment when required by building or fire codes.
- Mobile Equipment. Fire suppression systems shall be installed in Reclamation-owned and controlled and General Services Administration (GSA)-owned mobile equipment, including watercraft, when required by applicable fire codes or when deemed necessary by the fire prevention plan.
- Design, Installation, and Modification. All new fire suppression systems, and any modifications to existing fire suppression systems, shall be designed and installed to meet the requirements of applicable NFPA codes and standards, the IFC, and OSHA 29 CFR 1910 Subpart L.
- Carbon Dioxide Personnel System Safety

    - Hazards to Personnel. Fixed carbon dioxide fire protection systems shall not be installed in occupied spaces due to carbon dioxide's oxygen displacement and poisonous characteristics that cause asphyxiation and physiological effects.
    - Protected Space Entry. Entry into any space protected by a fixed carbon dioxide fire protection system shall only be allowed after the carbon dioxide system is blocked from operation by lockout/tagout (clearance) procedures.
    - Warning Signs. Carbon dioxide protected area warning signs shall be affixed in conspicuous locations in every protected space, at every entrance to protected spaces, in spaces near protected spaces where it is determined that carbon dioxide

could migrate creating a hazard to personnel. Warning signs shall also be affixed at each entrance to carbon dioxide storage rooms, and where carbon dioxide can migrate or collect in the event of a discharge from a storage container safety device.

- Inspection, Maintenance, and Testing

  - Water-Based Systems. All water-based fire suppression systems shall be inspected, tested, and maintained to meet the requirements of NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, and OSHA 29 CFR 1910 Subpart L. These systems include sprinkler, deluge, and water mist systems; standpipes; water mains; and fire pumps.
  - Carbon Dioxide Systems. All carbon dioxide extinguishing systems shall be inspected, tested, and maintained to meet the requirements of NFPA 12, Standard on Carbon Dioxide Extinguishing Systems, and OSHA 29 CFR 1910 Subpart L.
  - Clean Agent Systems. All clean agent fire extinguishing systems shall be inspected, tested, and maintained to meet the requirements of NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems, and OSHA 29 CFR 1910 Subpart L.
  - Halon 1301 Systems. All Halon 1301 fire extinguishing systems shall be inspected, tested, and maintained to meet the requirements of NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems, and OSHA 29 CFR 1910 Subpart L.

- Records. As-built system installation drawings, hydraulic calculations, original acceptance test records, device manufacturer's data sheets, and manufacturer's operating instructions shall be retained for the life of the system and shall conform with Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

b. Fire Alarms and Notification Systems

- Buildings and Equipment. Fire alarm and notification systems shall be installed in Reclamation facilities and on Reclamation equipment when required by building or fire codes or when deemed necessary by the fire prevention plan.
- Mobile Equipment. Fire alarm and notification systems shall be installed in Reclamation-owned and controlled and GSA-owned mobile equipment, including watercraft, when required by applicable fire codes or when deemed necessary by the fire prevention plan.
- Installation and Maintenance. All fire alarms and notification systems shall be designed, installed, inspected, maintained, and tested to meet the requirements of NFPA 72, National Fire Alarm and Signaling Code, the IFC, and OSHA 29 CFR 1910 Subpart L.
- Records. As-built system installation drawings, electrical calculations, original acceptance test records, device manufacturer's data sheets, and manufacturer's operating instructions shall be retained for the life of the system and shall conform with RCD 05-01.

c. Fire Extinguishers

- Buildings. Portable fire extinguishers shall be provided throughout all Reclamation facilities.
- Vehicles and Mobile Equipment. Portable fire extinguishers, at a minimum 5- pound 3-A:40-B:C rated, shall be provided in any Reclamation-owned and controlled or GSA-owned vehicle and mobile equipment used as a transportation van/bus, service vehicle, special purpose vehicle, material hauling vehicle, boom truck, lift trucks (forklifts), construction equipment, watercraft, etc.
- Selection, Installation, and Maintenance. The selection, installation, inspection, maintenance, recharging, and testing of portable fire extinguishers shall meet the requirements of NFPA 1, Fire Code; NFPA 10, Standard for Portable Fire Extinguishers; and OSHA 29 CFR 1910 Subpart L.

d. Fire Fighting Response

- Strategy. All Reclamation facilities shall have an overall fire response strategy as part of their fire response plan.
- Incipient-Stage Fire. All Reclamation facilities shall determine whether employees should use portable fire extinguishers to attempt to extinguish an incipient-stage fire or immediately evacuate the facility. This determination shall be based on the fire prevention plan and specified in the fire response plan.
- Portable Fire Extinguishers. All employees designated by the fire response plan, occupant emergency plan, or other safety requirement (i.e., job hazard analysis) to use portable fire extinguishers shall receive portable fire extinguisher training that meets the requirements in OSHA 29 CFR 1910 Subpart L.
- Fire Brigade

    - General. When deemed appropriate and necessary by the fire prevention plan, Reclamation facilities shall establish a fire brigade that meets the requirements of NFPA 600, NFPA 1977, and OSHA 29 CFR 1910 Subpart L
    - Classification. Fire brigades shall be classified into one or more of the following types:

        - incipient-stage firefighting,
        - advanced exterior firefighting,
        - interior structural firefighting, or
        - both advanced exterior and interior structural firefighting

    - Organizational Statement. If applicable, the Reclamation facility shall prepare and maintain a statement which establishes the existence of a fire brigade; the basic organizational structure; the type, amount, and frequency of training provided to fire brigade members; the expected number of members in the fire brigade; and the

functions the fire brigade is to perform at the workplace. This statement shall be part of the fire response plan.

- Fire Department Coordination. Reclamation facilities shall coordinate with the local fire department to outline the assistance fire responders will provide during a fire emergency, conduct pre-event planning, ensure equipment compatibility, and facilitate fire department familiarization with, and training at, the Reclamation facility.

e. Out of Service Fire Protection

- Employee Notification. Employees shall be notified when a fire protection feature is out of service.
- Risk Management. Measures shall be taken to ensure that increased risks during the out of service conditions are minimized and the duration of the out of service condition is limited.
- Tracking. All out of service fire protection features shall be tracked, by work orders until returned to functional condition.
- Return to Functional Condition. All out of service fire protection features shall be returned to functional condition and tested to verify functionality.
- Out of Service Over 24 Hours. The regional authority having jurisdiction and regional safety manager shall be notified of any fire protection feature that is, or is expected to be, out of service longer than 24 hours.

f. Building Evacuation

- Exit Signs. Exits from all buildings, shops, and other facilities where employees work, or are open to the public, shall be marked and illuminated per the requirements of NFPA 101. When an exit sign does not lead immediately out of the building, only exit signs leading in the direction of egress shall be visible. Any subsequent exit signs shall be visible.

  - Design. Exit signs shall have the word "EXIT" in plainly legible letters not less than 6 inches high, with the principal strokes of the letters in the word "EXIT" no less than 3/4-inch wide.
  - Illumination. Exit signs shall be illuminated to a surface value of at least 5 foot-candles (54 lux) by a reliable light source and be distinctive in color. Self-luminous or electroluminescent signs that have a minimum luminance surface value of at least .06 footlamberts (0.21 cd/m2) are permitted.

- Evacuation Diagram. When deemed appropriate and necessary by the fire emergency action plan, Reclamation facilities shall post evacuation diagrams reflecting the actual floor arrangements and exit locations on each floor. Per NFPA 101, the evacuation diagrams are required in facilities classified as assembly occupancies.
- Exit Doors and Paths. Exit doors shall not be locked in the direction of egress when the building is occupied, or the door shall be opened from the inside by a single motion

system that will unlock and open the door without keys, tools, or special knowledge. Exit paths shall always be clear of obstructions.

- Means of Egress. The means of egress for all buildings shall meet the requirements of NFPA 101.
- Delayed Evacuation.

    - Delayed Evacuation Plan. Facilities with critical operations that must be shut down in an orderly manner during an emergency event evacuation shall have a written delayed evacuation plan. The delayed evacuation plan shall designate personnel to complete critical operations.
    - Risk Assessment. The supervisor completes and documents the risk assessment for the delayed evacuation. The risk assessment shall consider NFPA 101, paragraphs 40.2.5.2.2, A.4.8.2.1(3), and A.40.2.5.2.2 (2018 edition). The written risk assessment shall be maintained and reviewed with employees designated for delayed evacuation as part of the fire emergency action plan. All identified risks shall be mitigated to the greatest extent possible.

g. Hot Work Operations

- Hot Works Operations Plan. All Reclamation facilities shall have a written hot work operations plan. NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, shall be used as a guideline for the hot work operations plan and hot work permit system. The hot work operations plan shall address the following hot work operations/equipment:

    - welding and cutting processes,
    - open flames,
    - heat treating,
    - grinding,
    - thawing pipe,
    - powder-driven fasteners,
    - hot riveting,
    - torch-applied roofing, and
    - similar applications producing or using spark, flame, or heat.

- Designated Areas. Hot work operations shall be conducted in designated areas that meet the requirements of NFPA 51B and are kept fire safe (e.g., noncombustible or fire-resistive construction, free of combustible and flammable contents, and suitably segregated from adjacent areas by a 35-foot combustible-free space or a barrier constructed of noncombustible materials).
- Hot Work Permit System. A hot work permit system shall be used for all hot work operations conducted outside of designated areas referenced in paragraph 1.09.7.g.

h. Smoking

- Facilities and Outdoors. Smoking shall not be allowed inside or within 25 feet of any entrance, air intake, outdoor storage, or fuel-dispensing areas.
- Vehicles and Mobile Equipment. Smoking shall not be allowed in any Reclamation-owned or GSA-owned vehicles and mobile equipment, including watercraft.
- Signage. “No Smoking or Open Flames” signs shall be posted in all areas where smoking is prohibited.
- Designated Areas. Designated smoking areas shall be established at Reclamation facilities and shall be located at least 25 feet from any entrance or air intake.
- Disposal. Cigarettes and other smoking waste shall be discarded only into containers designed and listed by a Nationally Recognized Testing Laboratory (NRTL) for disposal of smoking materials.

i. Internal Combustion Engines

- Spark Arrester. Any internal combustion engine used in proximity to grass, brush, timber, or similar cellulose materials shall be equipped with a spark arrestor that meets the performance and maintenance requirements of Department of Agriculture, U.S. Forest Service Standard 5100-1d, Standard for Spark Arresters for Internal Combustion Engines.
- Wildland Fire Hazard. Any vehicles or equipment with internal combustion engines used in proximity to grass, brush, timber, or similar cellulose materials shall be evaluated as a potential wildland fire ignition hazard. The evaluation shall include potential ignition sources (e.g., hot surfaces, sparks).
- Flammable Vapors Hazard. Any vehicles or equipment with internal combustion engines used in proximity to flammable vapors or gases shall be evaluated as a potential ignition hazard. The evaluation shall include potential ignition sources (e.g., engine overspeed, hot surfaces, sparks).

j. Open Flame Devices

Open fire and flame devices, such as incinerators, torches, and controlled fires, shall not be left unattended.

k. Cleaning and Degreasing

Gasoline or liquids with a flashpoint below 100 degrees Fahrenheit shall not be used for cleaning and degreasing; only nonflammable liquids or liquids with a flashpoint above 100 degrees Fahrenheit shall be used.

l. Explosive Gases and Vapors

Open flames or heating elements shall not be used where flammable gases or vapors may be present.

m. Housekeeping

- General Requirements. All Reclamation facilities and job sites shall be kept clean and orderly by removing all unnecessary combustible and noncombustible materials, waste, and debris at the end of each work shift or day.
- Collection of Waste Materials.
    - Containers. Employees shall use NRTL-labeled, self-closing metal containers to collect waste saturated with flammable or combustible liquids. Employees shall only use noncombustible or NRTL-labeled, nonmetallic containers to collect waste and rubbish.
    - Separation of Combustible Items. Employees shall keep combustible items separate from other types of combustible items and from noncombustible items.
    - Container Labels. All containers, except in office settings, used to collect waste shall be affixed with a label indicating the intended contents (e.g., trash, oily rags, scrap metal).
- Vehicles and Mobile Equipment.
    - General Requirements. Employees shall keep all Reclamation- owned and controlled or GSA-owned vehicles and mobile equipment, including watercraft, clean and orderly by removing all unnecessary combustible and noncombustible materials, waste, and debris at the end of each work shift or day.
    - Cleaning. Employees shall keep engine compartments, mechanical and hydraulic operation components, and storage and utility areas of vehicles and mobile equipment clean, as needed, to prevent the buildup of combustible debris and oily deposits.
- Inspections. All employees shall conduct daily housekeeping checks. Employees do not need or maintain to record daily checks in the Department's official repository.

n. Ground Maintenance

- General Requirements. Employees shall maintain grounds at all Reclamation facilities and job sites by keeping areas clean and the surrounding vegetation controlled.
- Cleaning. Custodial employees shall collect and remove waste around facilities and job sites on a regular schedule, or as needed, to prevent accumulation.
- Outdoor Waste Disposal. Waste materials placed outdoors or in dumpsters for disposal shall be located at least 20 feet from structures.
- Vegetation. On a regular schedule, or as needed, qualified employees shall control the growth of tall grass, brush, and weeds surrounding facilities and job sites using mechanical and chemical means to reduce fire risk.
- Fire Break. A minimum 3-foot clear fire break shall be maintained at all facilities and job sites.

o. Separation of Buildings and Structures

Non-fire-resistive buildings or structures shall be at least 25 feet apart. Reclamation considers a group of non-fire-resistive buildings with a total ground floor area of no more than 2,000 square feet as one building for this purpose, provided that each building in the group is at least 10 feet away on each side from other buildings.

p. Heating Devices

- General Requirements. Temporary portable heating devices shall meet the requirements of NFPA 1, paragraph 11.5, Heating Appliances, and OSHA 29 CFR 1926 Subpart F, Fire Protection and Prevention.
- Approval. The use of temporary portable heating devices must be approved via a permit issued by regional or area management for Reclamation-owned facilities and job sites or by the GSA building manager for GSA-owned facilities.
- Permit Request. The following information shall be submitted when requesting a temporary portable heating device permit:

    - proposed placement, including distance from combustibles,
    - service, maintenance, and surveillance schedules,
    - proposed fuel storage and refueling system, and
    - method for prompt detection of gaseous contamination or oxygen deficiency

- Data Plates. The temporary portable heating device shall have a permanently affixed data plate that provides the following information:

    - required clearances,
    - ventilation requirements,
    - fuel type and input pressure,
    - lighting and extinguishing instructions, and
    - electrical power supply characteristics

- Wood Floors. Heaters that are not suitable for use on wood floors shall be affixed with labels instructing users not to place them on wood or other combustible floors. When using such heaters, place them on noncombustible material equivalent to at least 1-inch-thick concrete and extends at least 2 feet beyond the heater in all directions.
- Combustible Covering. Employees must not use heaters near combustible tarpaulins, canvas fabric, or similar coverings. Employees must place heaters at least 10 feet away from combustible coverings and must securely fasten or tie down the coverings.
- Stability. Employees must place heaters on level surfaces to prevent tipping.
- Installation. Qualified employees must install, vent, operate, and maintain heaters in accordance with the manufacturer's instructions.
- Spark Arresters. Qualified employees must install spark arresters on smokestacks that could otherwise permit sparks to escape.

- Carbon Monoxide Monitors. Facilities using portable heating devices powered by combustible fuel must have functional carbon monoxide monitors installed. The carbon monoxide monitors must be inspected and tested following manufacturer's instructions.
- Grounding. Qualified employees must ground the non-current-carrying metal parts of cord- and plug- connected heaters.
- Office Spaces. Only electric portable space heaters equipped with tip-over safety switches, overheat protection, and thermostatic controls shall be permitted for use in office spaces.
- Electric Space Heaters.

    - NRTL Listing. All electric space heaters shall be listed by a NRTL.
    - Clearance. A minimum 3 feet of clearance from combustible materials shall be maintained around all electric space heaters.

- Liquid-Fueled Heaters. Liquid-fueled heaters shall meet the requirements of NFPA 31, Standard for the Installation of Oil-Burning Equipment.
- Natural Gas Heaters. Natural gas heaters shall meet the requirements of NFPA 1 and NFPA 54, National Fuel Gas Code.
- Liquefied Petroleum Gas Heaters. Liquefied petroleum gas heaters shall meet the requirements of NFPA 1 and NFPA 58, Liquefied Petroleum Gas Code.
- Restricted Use.

    - Open Flame-Type Heaters. Facilities and employees shall not use open flame-type heating devices with exposed fuel below the flame.
    - Lubrication or Service Areas. Heaters in lubrication or service areas, where employees do not dispense or transfer flammable liquids, must be approved and installed at least 18 inches above the floor to protect the heater from damage. Heaters in areas where employees dispense flammable liquids shall be approved for garage use and installed at least 8 feet above the floor.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.10 Electrical Safety Requirements

1. Scope

This section sets general electrical safety requirements for Reclamation facilities and operations to protect employees from electrical hazards. For tasks and activities that involve an exposure to hazardous electrical energy such as working on electrical equipment or interacting with energized electrical equipment, refer to Facilities Instructions, Standards, and Techniques (FIST) 5-14, Electrical Safety Program. For work on or near any equipment or system that produces, uses, or stores hazardous electrical energy refer to FIST 1-1, Hazardous Energy Control Program.

2. General Requirements

Reclamation's goal is to control electrical safety hazards by de-energizing and locking out electrical equipment utilizing approved hazardous energy control procedures. A qualified electrician or qualified employee must perform any electrical work, repair, or maintenance. This includes any work that involves removing electrical cover plates (faceplates) or control panel covers or otherwise exposing bare conductors, connectors, controls, or terminals. Qualified employees must follow the requirements identified in Table 1.10-1, Applicable Standards and Codes.

TABLE 1.10-1 Applicable Standards and Codes

Standard or Code	Title
FIST 1-1	*Hazardous Energy Control Program*
Fist 3-6	*Storage Batteries Maintenance and Principles*
FIST 5-1	*Personal Protective Grounding for Electrical Power Facilities and Power Lines*
FIST 5-14	*Electrical Safety Program*
Facility-Specific Standards	*Facility Electrical Safety Program, Standing Operating Procedures, Written Grounding Procedures*
Occupational Safety and Health Administration (OSHA)	29 CFR 1926 Subpart K
OSHA	29 CFR 1910.269 Electrical Power Generation, Transmission, and Distribution
National Fire Protection Association (NFPA)	NFPA 70E
NFPA	NFPA 70, National Electrical Code (NEC)

3. Responsibilities

a. First-Line Supervisors

- Shall ensure employees have the training and resources to perform assigned electrical work safely.
- Shall review, update, and sign Job Hazard Analyses (JHA) prior to any electrical work performed by their employees.
- Shall provide the necessary personal protective equipment (PPE) identified in the JHA and replace it if the condition of the PPE makes it no longer effective.
- Shall complete Electrical Safety Training per FIST 5-14, Electrical Safety Program.

b. Onsite Job Leads

- Shall review, update, and sign JHAs for electrical work they oversee.
- Shall ensure required PPE is available and on hand at the job site prior to starting work.

c. Employees Performing the Work

- Shall review, update, sign, and follow the JHA for electrical work, including wearing the PPE identified in the JHA
- Shall maintain electrical tools and maintenance equipment in good working condition (i.e., clean and dry state with no broken parts), and report necessary repairs to facility managers.

d. Regional Safety Manager

- Shall provide support and guidance related to their regional facility electrical safety programs.

4. Training Requirements

a. Requirements

First-line supervisors must provide training to personnel to the level of work they will perform. Initial training for any employees with potential exposure to an electrical hazard while working on or around the sources of electrical energy shall include basic electrical safety training, the safe use of tools, an overview of lockout/tagout, and the proper use of PPE. All supervisors and qualified employees responsible for performing energized electrical work or risk assessment and mitigation must have Qualified Electrical Worker Safety Training and Risk Assessment and Mitigation Training as specified in OSHA 29 CFR 1910.269 and NFPA 70E. Refer to FIST 5-14 for additional detail on the training requirements for qualified electrical workers.

b. Recordkeeping

Supervisors must enter the required electrical safety training in the Department of the Interior's approved repository, managed in accordance with the Information Management Handbook as

referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Pre-job Briefing and Planning Requirements

a. Job Briefing

Before starting each job that involves exposure to electrical hazards, the supervisor or designee must conduct a job briefing with all employees that use, install, or maintain electrical equipment under lockout/tagout, or that perform other jobs in an area where employees are performing such maintenance. The supervisor or designee must hold additional briefings if significant changes occur during the course of the work. The briefing must cover the following topics.

- Job Hazard Analysis. The JHA must identify all electrical and nonelectrical hazards associated with the job and the supervisor or designee must discuss these hazards with the employees performing the work. Electrical hazards must include a shock risk assessment and an arc flash risk assessment.
- Hierarchy of Controls. The JHA should consider and document these safety control strategies, listed below in order of decreasing effectiveness, prior to performing any electrical work.

    - Elimination. Qualified employees can achieve the elimination of risk from sources of electrical energy by de-energizing, verifying de- energization, locking/ tagging, and applying personal protective grounds (as applicable). This is also referred to as establishing an electrically safe working condition.
    - Substitution. The substitution or replacing of high-voltage control circuitry with lower voltage control circuitry to reduce potential hazard and risk by reducing energy.
    - Engineering Controls. Protection of the worker by keeping the worker away from the source of an electrical hazard or at a reduced energy state, such as use of remote racking system, providing a faster protection system, and/or guarding energized electrical conductors and circuit parts to reduce the likelihood of electrical contact or arcing faults.
    - Awareness. Posting signs alerting to the potential presence of hazards.
    - Administrative Controls. Supervisors must consider administrative controls including training, procedures, policies, or shift scheduling that lessen the threat of an electrical hazard to an employee.

b. Personal Protective Equipment

In the case of an arc flash, PPE does not eliminate the risk of injury, rather it only reduces the severity of the injury. Employees must use PPE as the last line of defense after considering all other strategies. First line supervisors must provide, and employees must use, the appropriate PPE needed to accomplish the job safely. Employees working on energized conductors and

circuit parts operating at 50 volts nominal or greater must use the appropriate level of PPE identified in NFPA 70E that meets ASTM standards.

6. Hazardous Environmental Conditions (Weather/Other)

Whenever possible, schedule outdoor electrical work for a time that minimizes exposure to inclement weather. When this is not possible, ensure the JHA includes controls to mitigate the effects of weather conditions, such as specialized switching gear (e.g., cold weather switching gear, wet weather switching gear) and other PPE. Refer to Reclamation Safety and Health Standard (RSHS) 1.04.7.a, Lightning Safety for additional information.

7. Personal Protective Equipment

a. Arc-Rated PPE

All employees, when working within the arc flash protection boundary, must wear non- melting, treated or untreated, natural fiber, or arc rated (AR) clothing. This includes undergarments, as a base to the appropriate PPE to protect the body from severe injury from an arc flash. AR clothing is a form of PPE. All AR PPE clothing worn within the arc flash boundary must meet the requirements of ASTM F1506 Standard Performance Specification for Flame Resistant and Electric Arc Rated Protective Clothing Worn by Workers Exposed to Flames and Electric Arcs. When the work requires AR PPE clothing, employees must follow the direction of NFPA 70E, and the PPE must allow for movement and visibility.

b. Shock Protective Equipment and Clothing

When working within shock protection boundaries, employees must wear shock protective PPE at the level identified in NFPA 70E. Reclamation does not permit conductive apparel including clothing, jewelry, or other personal items when working on or near exposed electrical conductors or circuit parts.

8. Safe Practices

a. Electrically Safe Working Conditions

Establishing an electrically safe work condition (ESWC) is the safest method for working on electrical equipment or circuit parts. For details on establishing an ESWC, see FIST 5-14.

- Non-ESWC Work and Normal Operations. Not all electrical work can be performed under an ESWC. Supervisors must consider safety control strategies to bring the hazardous energy down to the lowest level possible before working on energized electrical equipment. For details on conditions that may justify working on energized equipment, see FIST 5-14 and OSHA 1910.269, Electric power generation, transmission, and distribution.

b. Approach Boundaries

Prior to entering the arc flash boundary, shock protection boundary, limited approach boundary, or restricted approach boundary, qualified employees must meet the requirements of this RSHS section, FIST 1-1, and FIST 5-14. For approach boundary distances, see NFPA 70E table 2-1.3.4 and OSHA 29 CFR,1910.269 table R6. Unqualified employees must not enter any of these boundaries.

c. Access Control

- General. The facility must provide effective barriers or other means to ensure that people do not enter areas with exposed energized lines, electrical circuits, or equipment as passageways. The facility must also effectively guard live wiring or equipment to protect persons or objects from harmful contact.
- Perimeter Markings. Onsite job leads should use approved perimeter markings to isolate restricted areas from designated work areas and entryways. The onsite job lead must erect approved perimeter markings (e.g., barricades and/or synthetic rope) before work begins and maintain them for the duration of work. The qualified employee must indicate on the barrier the name and contact information for the employee in charge. Approved perimeter marking must be:

    - Barrier Tape. Install red barrier tape printed with the words “DANGER—HIGH VOLTAGE” around the perimeter of the work area and accessway approximately 42 inches above the floor or work surface.
    - Synthetic Rope Barrier. Install a barrier of yellow or orange synthetic rope 36 to 45 inches from the floor with standard danger signs of non-conductive material attached at 10-foot intervals containing the words “DANGER–HIGH VOLTAGE.”

- Barriers. Onsite job leads must construct and place fences, screens, partitions, or walls sufficient to prevent unqualified personnel or their equipment from entering the arc flash hazard or limited approach boundaries at the job site when live conductors are exposed or energized work is being performed. The onsite job lead must mark this barrier with tape or signage stating “DANGER—HIGH-VOLTAGE.” Only qualified employees authorized to perform the required work may cross this barrier.
- Working Space. The onsite job lead must provide a working space of at least the width of the equipment or 30 inches (whichever is greater) horizontally where qualified employees will require front or rear access to work on energized parts of enclosed equipment. Doors and hinged panels must be able to open to at least 90 degrees. Employees must not store parts, tools, or equipment in the clear space.
- Passage Barriers. The onsite job lead must use effective barriers or other means (barricades) to ensure employees do not use areas containing electrical circuits or equipment as passageways when energized lines or equipment are exposed for testing or maintenance. This includes open doors on motor control centers and switchgear.

d. Working Near Exposed Energized Conductors or Circuit Parts

- General. To reduce the risk of electrical injury from exposure to an energized electrical conductor or circuit part, qualified employees must follow the approach boundaries specified in NFPA 70E Article 130. This subsection discusses specific hazard identification and safety measures required of qualified and unqualified employees while working on or near exposed energized electrical conductors or circuits.

e. Underground Lines

The facility must protect employees from all hazardous underground lines by installing surface signs and a longitudinal warning tape buried 12 to 18 inches above the lines. Qualified employees must not perform drilling, augering, or material excavating operations within 6 feet of underground lines unless the lines have been de-energized. Call 811 (the national call-before-you-dig number) to request marking of the approximate location of buried utilities with paint or flags prior to digging. Also contact any local utilities to ensure any other utilities/services that 811 may not cover or identify have been located.

f. Overhead Lines

The facility must protect employees from all hazardous overhead lines by implementing the following:

- Equipment Transit Clearances. A signal or flag person must guide cranes, cherry pickers, high lifts, and other equipment in transit near exposed energized lines or parts at all times. Qualified employees or operators must not move any equipment or machinery under energized overhead high-voltage lines or near exposed energized parts unless employees confirm or maintain clearances listed in NFPA 70E. All employees are responsible for prohibiting equipment from coming any closer to overhead high-voltage lines or exposed energized parts than the distances required in NFPA 70E and OSHA 1926.1408, Power line safety (up to 350 kV)-- equipment operations.
- Sign Posting. It is the responsibility of the onsite job lead to post appropriate signs at all crossings where employees will move equipment under energized high-voltage lines. The onsite job lead must place the signs 50 feet from, and on both sides of, the lines. Signs must be large enough for employees to easily read them from moving equipment. The sign must include the following information:
    - warning of the high-voltage line,
    - line voltage, and
    - maximum height of equipment that may pass under the line.
    - A qualified employee must determine the maximum allowable height of the equipment.

- Placard Posting in Equipment Cabs. Onsite job leads must post a placard of minimum clearances in the cabs of all cranes, cherry pickers, shovels, backhoes, and any other equipment with booms or extensions that could possibly contact high- voltage lines. Clearances can be found in OSHA 1926.1408, Operations below power lines. Placards posted in machines must be made of a substantial material suitable for the environment. Devices originally designed by the manufacturer for use as a safety device (see § 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the manufacturer's procedures for use and conditions of use.

g. Electrical Equipment and Systems

Electrical wire, conduit, apparatus, power tools, and equipment used must be approved or listed by Underwriters Laboratories Inc., FM Global, or another nationally recognized testing laboratory for specific applications. This approval or listing must appear on each piece of equipment or tool as part of the marking or labeling required below. A requirement for approval or listing of other types of electrical equipment is at the discretion of the electrical engineer of record for the project unless required by Federal codes and standards or by NFPA codes.

- Marking or Labeling. Employees must not work on electrical equipment unless the manufacturer’s name, trademark, and/or other descriptive markings by which the manufacturer is identified are located on the equipment. Markings must also provide voltage, current, wattage, approvals/listings, and ratings as required by the edition of the (NEC) in effect at the time of purchase. Markings must be sufficiently durable to withstand the environment.

h. Personal Protective Grounds

The application, removal, and use of personal protective grounds must comply with the applicable sections of FIST 1-1, FIST 5-1, and FIST 5-14.

- General. Qualified employees must comply with applicable provisions of FIST Volume 5-1 “Personal Protective Grounding.” Qualified employees must also include written grounding procedures in all clearances, special work permits, etc. The JHA must include the procedures and employees must discuss them before beginning work.
- Over 600 Volts. Qualified employees must place grounds as close as possible to the work and within sight of the workers for all electrical circuits and equipment operated in excess of 600 volts. The clearance holder is personally responsible for proper placement and removal of protective grounds.
- Personal Protective Ground Cables. Personal protective grounds and clamps must be capable of conducting the calculated maximum fault current available for the time necessary to clear the fault. The personal protective grounds and clamps must be sized in accordance with FIST 5-1.

- Prior to Applying Grounds. After implementing hazardous energy control, qualified employees must use a hot stick “noise tester” or similar approved device of sufficient insulating capacity to verify that the circuit or equipment is de-energized before placing personal protective grounds. Qualified employees must test the voltage tester immediately before use on a known energized source of similar voltage before testing the equipment to be worked on. Employees must consider the circuit/equipment to be worked on energized while conducting the test.
- Placement and Removal of Personal Protective Grounds. After de-energization, the qualified employee must install personal protective grounds so that all phases of lines and equipment are visibly and effectively bonded together in a multi-phase short and connected to ground at one point. The qualified employee must not use single-phase personal protective grounds or grounding chains. The qualified employee must install personal protective grounds using a hot-stick or voltage-rated gloves on both sides of the work area, if possible. This precaution prevents a possible backfeed, especially when working on transformers and related equipment. When attaching grounds, the qualified employee must attach the ground end first, and then attach the other end to the de-energized circuit. When removing personal protective grounds, the qualified employee must first remove the grounding clamp from the de-energized circuit using a hot stick or voltage-rated gloves, and then remove the other end from the ground connection.

i. Temporary Wiring

- Installation and removal. Temporary wiring must meet all the requirements of the NFPA 70E. Onsite job leads may only permit temporary service, feeder, and branch circuit wiring during the period of construction, remodeling, maintenance, repair, or demolition. The onsite job lead must ensure employees remove temporary wiring immediately upon completion of construction or purpose of installing the wiring. Temporary wiring shall be multi-conductor cord or cable of a type permitted by Article 590 of the NEC. Temporary wiring shall have a means of disconnecting such as a switch or plug connector and equipped with overcurrent protection in accordance with the NEC. Qualified employees must remove all temporary wiring from the site as soon as the work is complete.
- Wet and Damp Locations. Article 310 of the NEC must list or approve any conductors used in tunnels, shafts, trenches, and wet or damp locations.
- Bushings. Wiring installed in conduit must be equipped with bushings at the ends of the conduit.
- Receptacles. Receptacle circuits must include ground fault protection for personnel (i.e., Ground-Fault Circuit Interrupter (GFCI)). Employees must not install receptacles at construction sites on branch circuits that supply temporary lighting. Receptacles installed in wet or damp locations shall have a weatherproof enclosure for the receptacle whether the attachment plug is inserted or not.

- Lighting Strings. Temporary lighting strings must consist of nonconductive lamp sockets and connections permanently molded to the conductor insulation. All temporary lighting must use lamp guards to protect bulbs attached to festoon lighting strings and extension cords. Employees must promptly replace broken or defective bulbs and protect all lights from accidental contact or breakage.

j. Extension Cords

Extension cords must be three-wire grounded type, designated as hard service electrical cord or extra hard service electrical cord, and listed by a nationally recognized testing laboratory such as Underwriters Laboratories Inc. or FM Global. Employees must fully unwind cords prior to use. Employees must not exceed the rated load of the extension cord. Employees must only use cords in continuous lengths without splicing and must not use worn or frayed extension cords. To protect cable assemblies, flexible cords, and cables from damage, employees should provide support with approved staples, cable ties, straps, or similar fittings.

k. Prohibition of Daisy Chains

Reclamation prohibits daisy chaining, (i.e., connecting power strips or extension cords in series), as well as connecting power strips and extension cords together in any form.

l. Disconnect and Overcurrent Protection

- Marking. Reclamation facilities and operations must plainly mark, label, or arrange switches, fuses, and automatic circuit breakers to identify the circuits or equipment they control.
- Switches. Switches must have grounded enclosures and the installation must minimize the possibility of accidental operation.
- Lockout Provision. Reclamation facilities and operations must provide disconnects and breakers with a means of locking in the off position. Fuse cabinets and circuit breaker cabinets must have lockable doors.
- Wet and Outside Locations. Reclamation facilities and operations must encase switches, circuit breakers, fuse panels, and motor controllers in wet or outside locations in approved weatherproof cabinets or enclosures to prevent moisture or water from entering or accumulating within the cabinet or enclosure.
- Service Entrance Disconnect. Reclamation facilities and operations must install a means to disconnect the service entrance in a readily accessible location and as close as possible to the point where the service entrance conductors enter the premises. This device must disconnect all the ungrounded service entrance conductors supplying power to the service equipment. This device must also plainly indicate whether it is in the connected or disconnected position.
- Overcurrent Protection. Reclamation facilities and operations shall only install and use fuses or circuit breakers that provide adequate overcurrent protection at the level required for all ungrounded conductors. All overcurrent protection devices and

conductors must be designed and installed according to the NEC Article 240, Overcurrent Protection, to ensure protection and proper installation.

m. Ground-Fault Protection

- Protection Requirement. Per NFPA 70, National Electrical Code, all single-phase receptacles rated ≤150 volts, ≤50 amps, and all three-phase receptacles rated ≤150 volts, ≤100 amps must be equipped with GFCI for personnel protection when the receptacles are used for construction operations or placed outdoors or in potentially wet locations (e.g., laboratories, shops, garages, bathrooms, kitchens, rooftops, locker rooms, and crawl spaces). The GFCI must open the circuit on a ground current of 5 milliamperes and must have an integral push-button test circuit. Qualified employees must install the GFCI in accordance with the manufacturer's instructions and test it before initial use and periodically thereafter.

n. Hazardous (Classified) Locations

A hazardous (classified) location is any location where either a fire or an explosion can occur because of the presence of flammable, combustible, or ignitable materials (e.g., gases, vapors, liquids, dust, and/or fibers). Wiring methods used in hazardous locations must comply with more stringent requirements than wiring methods used in other locations.

- Requirements for Wiring and Equipment. Electrical wiring and equipment installed in hazardous locations as defined in the NEC must conform to the NEC Article 500. All components and equipment used in hazardous locations must be listed suitable for such locations by a nationally recognized testing laboratory, such as Underwriters Laboratories Inc. or FM Global.
- Marking. Approved equipment must be marked to show the class, group, and operating temperature or temperature range referenced to a 40-degree Celsius ambient temperature. Facilities must install approved equipment in accordance with NEC requirements.
- Intrinsically Safe Systems. Facilities must use an intrinsically safe apparatus and wiring in any hazardous (classified) location for which Reclamation has approved the apparatus.
- Maintenance. Qualified employees and facilities must maintain wiring components and equipment as explosion-proof. There must be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to tight conditions.

o. Wet Locations

Only the following types of electrical systems are permissible for use in wet areas where there is danger of electrical shock.

- Ground-Fault Circuit Interrupter. Electrical circuits for lighting, hand tools, and other portable equipment must not exceed 120 volts and must be protected by UL- listed

ground-fault circuit interrupters installed by qualified employees in conformance with the manufacturer's specifications and tested before beginning work.

- Stationary Portable Equipment. Qualified employees must connect stationary portable electrically-powered equipment, such as pumps, heaters, blowers, welders, transformers, etc., to a circuit protected by a ground-fault circuit interrupter or effectively ground the equipment with both an internal grounding system and a visible flexible copper ground wire.
- Substitute Equipment. Whenever practical, employees must use air, battery, or hydraulically powered tools instead of electrically powered tools (i.e., tools plugged into an electrical outlet).

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.11 Walking and Working Surfaces

1. Scope

This section sets safety standards and work practices for walking and working surfaces for both general and construction work at Bureau of Reclamation facilities. It specifically addresses making work locations safe for access, using scaffolds, requirements of work platforms, designing and constructing guardrails, and required inspection and training. Walking and working surfaces are used daily by all employees, so the requirements in this section apply to everyone working in Reclamation facilities.

2. General Requirements

Walking and working surfaces must be kept clean, orderly, and sanitary. Floors and walking surfaces shall be cleaned regularly and kept dry. Ensure surfaces can support the maximum intended load and are free of obstructions and hazards that will cause slips, trips, or falls.

3. Responsibilities

a. Regional and Area Office Safety Managers

- Support development and implementation of this section and provide guidance in implementation.
- Monitor and interpret developments in walking and working surface regulations and technologies.
- Ensure a ladder safety program is in place and ladders are regularly inspected.

b. First-Line Supervisors

- Ensure their employees are trained and can demonstrate proficiency prior to requiring work on ladders, scaffolding, and elevated work surfaces.
- Regularly inspect work areas to ensure they are free of known work-surface hazards and good housekeeping is maintained.
- Shall be present when employees are working from crane-supported scaffolding to ensure compliance with Reclamation Safety and Health Standards (RSHS) Section 3.04.12.a-p, Pile Driving Equipment.

c. Onsite Job Leads

- Ensure a designated competent person is available for scaffolding work. Competent person roles are discussed in paragraph 1.11.4.c, “Proficiency Qualification.”

d. People Doing the Work

- Reclamation employees must ensure they are physically able to do a task and are appropriately trained prior to starting a task.

- All employees using ladders must ensure the ladder is inspected, labeled with critical information, capable of supporting the maximum intended load, and used properly.
- Employees responsible for completing work while using scaffolding and work platforms and for maintaining walking and working surfaces must seek guidance from the supervisor or area safety manager and meet the general requirements set in paragraph 1.11.9.f of this section.
- Employees are responsible for identifying and correcting unsafe conditions within their control and reporting those they cannot, and voicing concerns to their coworkers and supervisors in a professional and respectful manner.

e. Project Manager/Acquisitions

- Project Managers must be notified verbally or in writing of any changes to the design and use of scaffolding.

4. Training Requirements

a. Initial

Reclamation employees must receive relevant training prior to engaging in work.

- Ladders. All employees who use ladders must complete ladder safety training and understand how to select and use the appropriate ladder. If a ladder safety device is required, employees must be trained in its operation before using it. Ladder safety training shall include, at a minimum, the selection, inspection, set up, and proper use of ladders available in their workplace.
- Scaffolding
    - Performing Work. Each employee who performs work while on a scaffold must be trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:
        - the nature of any electrical hazards, fall hazards, and falling object hazards in the work area,
        - the correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used,
        - the proper use of the scaffold and the proper handling of materials on the scaffold,
        - the maximum intended load and the load carrying capacities of the scaffolds used, and
        - any other pertinent requirements of this section.

  - Operation and Maintenance. Each employee involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold must be trained by a competent person to recognize any hazards associated with the work. The training shall include the following topics, as applicable:

    - the nature of scaffold hazards,
    - the correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in use,
    - the design criteria, maximum intended load carrying capacity, and intended use of the scaffold, and
    - any other pertinent requirements of this section.

- Aerial Lifts. Only trained and authorized persons are allowed to operate an aerial lift. Training should include the following topics:

  - explanations of electrical, fall, and falling object hazards,
  - procedures for dealing with hazards,
  - recognizing and avoiding unsafe conditions in the work setting,
  - instructions for correct operation of the lift (including maximum intended load and load capacity),
  - demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job,
  - when and how to perform inspections, and
  - manufacturer's requirements.

b. Refresher/Retraining

- Refresher Training. Refresher training for ladders, scaffolding, and aerial lifts is required at least annually, or before starting work if work occurs on a less than annual basis.
- Retraining. Additional retraining shall occur in the following circumstances:

  - when changes at the worksite present a hazard about which an employee has not been previously trained,
  - when changes in types of scaffold, fall protection, falling object protection, aerial lift, or other equipment are implemented, and
  - if the supervisor believes the employee lacks the necessary skill, understanding, or proficiency to work safely.

c. Proficiency Qualification

OSHA scaffolding standards differentiate between a competent and a qualified person for various responsibilities. Detailed explanation can be found in the OSHA publication A Guide to Scaffold Use in the Construction Industry. A competent person can identify existing and predictable hazards and has authorization to act in order to eliminate them. A qualified person

has, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience, demonstrated ability to solve or resolve scaffolding problems.

d. Recordkeeping

Training shall be managed and recorded through the agency system of tracking training.

5. Hazard Identification, Assessment, and Safety Measures

a. General

First-line supervisors and employees working at their site are responsible for inspecting walking and working surfaces for hazards and unsafe conditions. Hazardous conditions must be corrected or repaired before an employee uses the surface again.

b. Wet Surfaces

If a walking and working surface is wet and the condition cannot be reasonably prevented, additional safety measures shall be in place. A reasonable effort must be made to reduce standing or running water on walking surfaces. Surface modifications, which include surface channeling the water, grooving, installing false floors, or installing platforms and mats, are recommended.

c. Snow and Ice

When hazardous conditions such as snow and ice are present, the walking and working surface must be shoveled and salted to reduce risk of slips, trips and falls.

6. Pre-Job Briefing and Planning Requirements

a. Job Hazard Analysis (JHA)

Before starting work, employees must be briefed on the known safety hazards present in the work area. Job tasks with known and assumed risks shall have an existing JHA readily available and updated with any change in hazard or mitigation (see RSHS Section 1.04, Work Safety Planning). Employees and supervisors must review JHAs annually or after any changes.

b. Crane-Supported Personnel Platforms

For crane-supported personnel platforms, place approved systems in operation only after a JHA is developed. The JHA must contain provisions for initially and periodically instructing the crane operator and all affected employees. A pre-lift meeting must be held before each personnel hoisting operation. The crane operator, involved employees, and supervisors must attend the pre-lift meeting.

7. Personal Protective Equipment (PPE)

Employees must wear PPE as required by their JHA.

a. Fall Protection

Fall protection is required for each employee exposed to a falling hazard of 4 feet or more. Depending on site conditions and job tasks, fall protection includes guardrails, toe boards, floor hole covers, fall arrest systems, stair railings, and handrails. Vertical or horizontal lifelines can be used. When working from an aerial lift, attach the fall-arrest system to the boom or basket. When using suspension scaffold, both a personal fall-arrest system and guardrail are required. Refer to RSHS Section 1.14, Fall Protection, for additional fall protection information and specific PPE.

b. Overhead Protection

When working on or near scaffolding, employees shall wear hard hats to prevent injury from falling objects. Provide overhead protection whenever falling objects could pose a hazard to the public, employees, or property. The overhead protection must be strong enough to withstand all potential impacts. Design overhead protection to meet the needs of the walking-working surface and the users being protected.

c. Ladder Safety

Employees must wear proper footwear when ascending and descending ladders. Footwear must be closed toe and non-slip material and defined heel. Where ladder safety devices are provided, employees must be trained and use them per manufacturer's instructions.

8. Other Safety Equipment

a. Crawling Boards

- Use. Use crawling boards or chicken ladders, to help employees climb up and down sloped surfaces. Each employee on a crawling board shall be protected by a personal fall arrest system, a guardrail system, or a 3/4-inch diameter grab line or equivalent handhold securely fastened beside each crawling board.
- Construction. Crawling boards shall extend from roof peak to eaves and be secured by ridge hooks or means with equivalent strength and durability. Boards must be at least 10 inches wide and 1 inch thick, with 1- by 1.5-inch cleats spaced not more than 24 inches apart. The raised cleats must equal the width of the crawl board. Secure the cleats with nails driven through the crawling board and clinched on the underside.

9. Safe Practices

a. Safe Access to Work

Use ladders, stairways, or ramps that comply with the requirements of this section to provide safe access to all work locations (temporary or permanent). Provide a stairway, ladder, ramp, or personnel hoist at all personnel access points where elevation changes 19 inches or more. Keep at least one point of access between levels of buildings or structures so employees can

always pass freely. Walking and working surfaces shall be inspected regularly to ensure they are maintained and repaired to prevent hazardous conditions.

b. Ladders

A ladder safety program shall be implemented at all facilities and include standards and responsibilities of this Section.

- Safety Codes. Ladder use must comply with the applicable ladder safety codes 29 CFR 1926.1053 (construction), 29 CFR 1910.23 (general industry) and ANSI A14.
- Inspection. Regularly inspect and maintain all ladders to ensure hazardous conditions are corrected, repaired, and guarded against. Promptly repair broken or damaged ladders or remove them from service.
- General Use. Ensure the proper ladder is selected for the task. Only one employee can use the ladder at a time, and the employee shall not climb higher than 20 feet. Employees shall face the ladder and keep hands free to climb when ascending and descending. Employees shall use at least one hand to grasp the ladder when progressing up and down the ladder and shall not carry any object or load that could cause them to lose balance and fall.
- Portable Ladders. Select, use, and maintain portable ladders according to the most current applicable ANSI A14 standard, 29 CFR 1910.23(c) or standards in this section, whichever is most stringent having jurisdiction. Use only type 1A extra heavy-duty industrial ladders or better. Store ladders to prevent any damage, clutter, obstruction, or hazardous conditions.

    - Selection. Ensure the ladder duty rating found on the specification label on the side of the ladder, is appropriate for the total load that will be supported. Total load is the weight and force of the employee and all tools, equipment, and materials being carried. Equip the ladder with safety shoes, spurs, spikes, tread feet, or other slip-resistant devices appropriate for the surface it will be used on.
    - Use. Ladders shall be used only for short-duration tasks and only when using light tools or materials. Place portable ladders at a slope of 4:1 (vertical to horizontal) on a firm foundation that can support the load. Secure the ladder to prevent displacement. Stepladders can be used without being secured. When portable ladders are used for access to an upper landing surface, the side rails must extend at least 3 feet above the upper landing surface.
    - Restrictions. Do not use extension sections of ladders as independent ladders, unless specifically designed, manufactured, and tested to be used independently. Do not use a metal ladder or a wood ladder with metal reinforcements for any electrical work or any area where employees can contact energized circuits. The cap and top step of a stepladder shall not be used as a step.

- Fixed Ladders. Design, use, and maintain fixed ladders according to the current applicable ANSI A14 standard, 29 CFR 1910.23(d) or standards in this section, whichever is most stringent having jurisdiction. Keep the area around the top and bottom of a fixed ladder free from debris, material, equipment, or other obstructions.

    - Design. Equip new fixed ladders extending over 24 feet with a ladder safety system or personal fall arrest system. 2016 updates to 29 CFR 1910 Subpart D, Walking-Working Surfaces, require all fixed ladders to be equipped with a ladder safety or personal fall arrest system by November 19, 2036. Climbing devices must be installed so employees can connect or disconnect while standing on floors, platforms, or the ground. Ladders must be sufficiently wide to accommodate climbing devices while providing ample room for users to safely ascend and descend. Provide a landing at the top of all fixed ladders. Except for manhole ladders, extend side rails, stanchions, or other supports at least 42 inches above the landing. Ensure ladders have equal rung spacing for the entire length of the ladder and at least 7 inches of toe space from the centerline of the rung or step to the wall or other obstructions.
    - Use. Where ladder safety or personal fall arrest systems are provided, use per manufacturer's instructions. Always use non-slip material on rungs in slippery areas. When 25 or more employees require access or two-way traffic is necessary, use two separate ladders or double-cleat ladders for access to and from work areas.
    - Restrictions. Do not use the reinforcing bar of fixed ladders as a rung or grab bar. Do not design ladders with cages and wells as a means of fall protection.

c. Guardrails

- Compliance. Guardrail systems must comply with the OSHA fall protection requirements stated in 29 CFR 1910.29 or 29 CFR 1926.502, depending on application.
- Design. The top-edge height of top rails or equivalent guardrail system members must be 42 inches, plus or minus 3 inches, above the walking-working surface. Midrails must be installed at a height midway between the top edge of the guardrail system and the walking-working surface. Guardrails shall be designed such that openings between vertical members are not more than 19 inches wide. Regardless of the material used, the guardrail must be able to withstand a load of 200 pounds, applied in a downward or outward direction at any point on the top rail, with minimum deflection. The design of railings that must withstand greater load than 200 pounds must have a minimum safety factor of 4. Refer to the scaffolding standards and references for scaffolding guardrail requirements and specifications.
- Restrictions. Guardrails shall not be used as anchor points for fall protection systems.
- Stairways

    - Standard Stairs. Standard stairs are a fixed or permanently installed stairway providing access from one walking-working surface to another and must be in place when work requires regular travel between levels and regular access to platforms,

especially when employees routinely carry tools or materials. Standard stairs must meet the general requirements described in 29 CFR 1910.25, Stairways.

- Design. Standard stairs and temporary stairways shall be designed with any uniform combination of rise/tread dimensions within the following requirements:

    - minimum width of 22 inches between vertical barriers,
    - maximum riser height of 9.5 inches,
    - minimum tread depth of 9.5 inches,
    - maximum variation in tread height or depth of 1/4 inch,
    - minimum vertical clearance from stair tread to overhead obstruction of 6 feet, 8 inches, as measured form the leading edge of tread, and
    - each stair can support at least five times the normal anticipated live load, but never less than a concentrated load of 1,000 pounds.

- Existing standard stairs, installed prior to January 17, 2017, may deviate from these dimensions if they are at an angle between 30 and 50 degrees or meet the requirements specified in Table D-1 of 29 CFR 1910.25.
- Maintenance. Routinely maintain stairways, keeping stairs free from debris, materials, and slippery conditions.
- Stair Rail Systems and Handrails. Stairs with four or more risers or rising more than 30 inches must have a stair rail system and handrails that are smooth-surfaced and do not create a projection hazard. Stair rail systems and handrails must meet the criteria established in 29 CFR 1910.29(f). The height of stair rail systems installed before January 17, 2017, is not less than 30 inches from the leading edge of the stair tread to the top surface of the top rail; the height of stair rail systems installed on or after January 17, 2017, is not less than 42 inches from the leading edge of the stair tread to the top surface of the top rail. Handrails are not less than 30 inches and not more than 38 inches, as measured from the leading edge of the stair tread to the top surface of the handrail. Handrails must provide an adequate handhold for employees grasping them to avoid falling and meet requirements in 29 CFR 1910.28(b)(11)(ii), Table D-2, “Stairway Handrail Requirements.”
- Platforms. Any flight of stairs with an unbroken rise of more than 12 feet must have a standard landing that extends at least the width of the stair and 30 inches in the direction of travel. Where doors or gates open directly onto the stairway, provide a platform. Protect platforms on all open sides with standard guardrails and toe boards, as required for falling object protection. The swing of the door or gate must not reduce the width of the platform to less than 20 inches if installed before January 17, 2017, or less than 22 inches if installed on or after January 17, 2017.
- Temporary Stairways. Construct temporary stairways and handrails of materials without hazardous projections or surface imperfections, rigidly support them, and securely fasten stair treads in place.

d. Ramps

Ramps and bridging devices must be designed, constructed, and maintained to support their maximum intended loads. When the ramp is used for public access, wheelchair accessibility is required. Ramps used by employees that have a ramp angle greater than 20 degrees from horizontal must be provided with handrails meeting standards set in paragraph 1.11.9.d.(4), "Stair Rail Systems and Handrails." Ramp slope shall not exceed 30 degrees from horizontal. When there is any potential for objects to fall from above, install overhead protection between 7 and 9 feet above the ramp.

- Temporary Ramps. Design temporary ramps with a safety factor of 5, with a minimum 100-pound-per-square-foot live load capacity. Temporary access ramps can be installed in place of stairs when the slope does not exceed 15 degrees. With approval by the area office safety manager, cleated ramps can be used for access on slopes up to 20 degrees. Ramps must be at least 18 inches wide, with standard guardrails on open sides and at least one handrail. Cleated ramps must have 1- by 2-inch cleats spaced no more than 14 inches apart. The cleats must span the full width of the ramp. Secure cleats with nails driven through the decking and clinched on the underside. Provide vehicle trestles, ramps, and bridges that permit foot traffic with a suitable walkway and guardrail outside of the roadway. Protect roadway ramps with timbers or curbs at least 8 inches high and secured to each side of the roadway.
- Permanent Ramps. Permanent ramps must be at least 44 inches wide, and the slope must not exceed 1:12. The maximum allowable slope in any new construction is 1:12 with a maximum rise of 30 inches without a landing. A ramp with a slope of 1:12 can have a maximum length of 30 feet without a landing.

e. Scaffolds

Provide scaffolds, platforms, or temporary floors whenever employees perform work that they cannot perform safely from the ground or from solid construction. Scaffolds, both supported and suspension, must meet the requirements in 29 CFR 1926 Subpart L, Scaffolds. Do not use ladders or makeshift devices to increase scaffolding height. Keep scaffold working surfaces level and ensure good housekeeping to prevent slipping, tripping, or falling object hazards. A competent person must inspect scaffolds and components for visible defects before each work shift and after any occurrence that could affect the structural integrity and authorize prompt corrective action.

- Design. Scaffolding with structural members or working surfaces that differ from those specified in this standard must be designed by a Professional Engineer (PE). Wood scaffolding design must meet the specifications stated in 29 CFR 1926 Subpart L, Appendix A, Scaffold Specifications. A PE must design or certify additional strengthening for material hoists on scaffolds. Scaffolds shall not be altered or moved horizontally unless specifically designed to be so.

- Construction Integrity. The footing or anchorage for scaffolds must be sound, rigid, and able to carry the maximum intended load without settling or displacement. Do not use unstable objects (such as barrels, boxes, loose brick, or concrete blocks) to support scaffolds or planks. Make sure poles, legs, and uprights are plumb. Brace them securely and rigidly to prevent swaying or displacement.
- Loading. Scaffolds and components must be capable of supporting at least four times the maximum intended load. Suspension rope and connecting hardware must be able to support at least six times the maximum intended load. Do not load scaffolds beyond their maximum intended load. Store only those supplies needed for immediate operations on scaffolds. All load-carrying timber members of scaffolds, except planks, must be a minimum of 1,500-pound-force per square inch (stress grade) construction-grade lumber.
- Fall Protection. Each employee on a scaffold shall be protected from falling in accordance with 29 CFR 1926 Subpart L. Fall protection is required for each employee on a scaffold more than 10 feet above a lower level. Fall protection includes guardrail systems and personal fall arrest systems. Vertical or horizontal lifelines can be used. Self-contained and suspension scaffolding require both a guardrail system and a fall arrest system. Do not use wire, synthetic, or natural fiber ropes as guardrails on scaffolds.
- Enclosures and Overhead Protection. When scaffolding is above a walkway or employees pass under scaffolding, the scaffolding must be enclosed on all open sides, ends, and spaces between decking and wall. The protective enclosure must be No. 18 U.S. Standard gauge wire, or equivalent protective material, with openings of 1/2 inch or less. Protect employees working on scaffolding from falling objects by installing overhead protection such as toe boards, screens, guardrail systems, catch platforms, canopy structures, or barricades.
- Access. Always access scaffolding by separate or integral ladders or by stairways. Do not use structural members to access scaffolding.

f. Platforms and Planks

Platforms must be designed and constructed to meet the requirements of 29 CFR 1926.451(b) and 29 CFR 1926 Subpart L, Appendix A. Platforms must be wide enough to prevent congestion of persons, materials, or equipment. When moving platforms or planking to another adjacent level, leave the old planking in place until new bearers are installed. A PE must design special work platforms, like draft tube scaffolds and penstock jumbos. A competent person experienced in scaffold design, installation, and use must inspect the scaffold system for visible defects before each use and after any occurrence that could affect the scaffold's structural integrity. The inspection will include all rigging, hardware, connections, welds, decking, and structural members. Before any suspension scaffold system is used, all direct connections shall be evaluated by a competent person who must confirm, based on the original design, that the supporting surfaces can support the loads to be imposed. If any inspection reveals damage that

requires repair or modifications to the original design, a PE must recertify the scaffolding system before further use.

- Materials. Solid sawn wood used for scaffold planks must meet the specifications and compliance determinations listed in 29 CFR 1926 Subpart L, Appendix A. Fabricated planks and platforms can be used in lieu of solid sawn wood planks as long as rated load capacity meets or exceeds the capacity identified in 29 CFR 1926 Subpart L, Appendix A. All planks must be grade stamped or certified as scaffold plank grade and meet the specifications in ANSI A10.8, Scaffolding Safety Requirements.
- Lapped, Flush, and Corner Planking. When planking is lapped, it must overlap at least 12 inches and occur only over supports. When planking is installed flush, the butt joint must be at the centerline of a pole, and the plank ends must be supported by and secured to separate bearers. Where a scaffold changes direction (i.e., at a corner), place and secure planks to prevent tipping. Use diagonally installed bearers to support the intended load and to prevent tipping.

g. Supported Scaffolds

Supported scaffolds consist of one or more platforms supported by outrigger beams, brackets poles, legs, uprights, posts, frames, or similar rigid support.

- Requirements. Supported scaffold design and construction must meet or exceed the requirements of 29 CFR 1926.451(c) or this section, whichever is more stringent having jurisdiction. Refer to 29 CFR 1926 Subpart L, Appendix A for guidelines regarding the requirements of 29 CFR 1926.451(c).
- System Scaffolds. Erect system scaffolding per the manufacturer's guidelines. Do not intermix or modify load-carrying members of system scaffolding from different manufacturers, unless approved by a PE. The manufacturer's guidelines must be on the job site while the scaffold is erected, used, and dismantled. A PE must design scaffolds erected or used in a manner not covered in the manufacturer's guidelines.
- Metal Scaffolds and Towers. Erect such scaffolds and towers per the manufacturer's specifications. Do not exceed the manufacturer's rated load limits. Set sections of metal scaffolds plumb and securely connect them together. Install all braces before using the scaffold. Secure the entire scaffold together and brace it to the building or structure at intervals no more than 30 feet apart horizontally and 26 feet apart vertically. Provide metal scaffolds and towers with access ladders or stairways.
- Tube and Coupler Scaffolds. All tube and coupler scaffolds shall comply with additional requirements in 29 CFR 1926.452(b). Design and construct tube and coupler scaffolds to the specifications set forth in this section. A PE must review and approve all scaffold designs over 125 feet in height.

- Required Dimensions. Construct tube and coupler scaffolds of steel tubing not less than the minimum diameters and not more than the maximum spacing listed in Table 1.11-1

TABLE 1.11-1 Tube and Coupler Scaffold Dimensions

Component	Light Duty	Medium Duty	Heaving Duty
Posts, runners, and bracing diameter (minimum)	2 inches	2 inches	2 inches
Bearer diameter (minimum)	2 inches	2.5 inches	2.5 inches
Post spacing (maximum length)	10 feet	8 feet	6.5 feet
Post spacing (maximum width)	6 feet	6 feet	6 feet

Note: Design other spacing dimensions or other structural components and materials, when used, to support an equivalent load. Do not use dissimilar metals on the same scaffold frame.

- Bearers. Any bearers must be at least 4 inches but not more than 12 inches longer than the post or runner spacing. Bearers must be installed transversely between posts. When bearers are coupled to posts, the inboard coupler must bear directly on the runner coupler and be as close to the posts as possible. Bearers must extend beyond the posts and runners and provide full contact with the coupler. The bottom bearers must be located as close to the base as possible.
- Runners. Space runners no more than 6.5 feet apart on centers. Set the bottom runners as close to the base as possible.
- Transverse Bracing. Install transverse bracing, in an "X," diagonally across the width of the scaffold at the top and bottom of the end posts and at every fourth runner vertically. Repeat this "X" bracing at every third set of posts counted horizontally from one end of the scaffold.

h. Fabricated Frame Scaffolds

All fabricated frame scaffolds (tubular welded frame scaffolds) shall comply with additional requirements in 29 CFR 1926.452(c). Use tubular welded frame scaffolding only if it is designed to safely support four times the maximum intended load. Place the frames directly over one another, using couplings or stacking pins to vertically align the posts.

- Height Limitation. A PE must prepare drawings and specifications for metal frame scaffolds that are more than 125 feet high.
- Uplift. Lock frame members together vertically with pins or other equivalent means whenever there is a possibility that an uplift can occur.
- Cross Bracing. Properly brace metal tubular frame scaffolding with cross bracing or diagonal braces, or both, to secure vertical members. The length of the cross braces must automatically square and align vertical members. Make all brace connections secure.

i. Mobile Scaffolds

All mobile scaffolds shall meet the additional requirements in 29 CFR 1926.452(w).

- Moving. The height to base width ratio of the scaffold during movement is two to one or less. When moving mobile scaffolds, apply manual force as close to the base of the scaffold as possible, but not more than 5 feet above the supporting surface. Power systems used to move mobile scaffolds shall be designed for such use. Stabilize the scaffold during movement. Use scaffolds only on firm, level, and broom-clean surfaces. Equip wheels and casters with a positive locking device to prevent the scaffold from accidentally moving.
- Riding. Employees may ride manually propelled mobile scaffolds only under the following conditions:
    - the floor or surface is within 1.5 degrees of level and is free of pits, holes, or obstructions,
    - the minimum dimension of the scaffold base, when ready to move, is at least one-half the height,
    - if used, outriggers are installed on both sides of staging,
    - wheels or casters are equipped with rubber or similarly resilient tires, and
    - tools and materials are removed from or secured to the platform prior to moving the scaffold.

j. Figure-Four Form Scaffolds

Do not use figure-four form scaffolds to support loads more than 25 pounds per square foot unless specifically designed for greater loading. Design and construct figure-four form scaffolds according to the dimensions shown in Table 11.1-2. The form scaffold must be an integral part of the form and nailed or bolted to the form studding.

k. Metal Bracket Form Scaffolds

Metal bracket form scaffolds must be designed and constructed with a minimum safety factor of four times the maximum intended load. The metal brackets can be made of any metal that will support the maximum intended load. Equip them with standard guardrails and toeboards. Space metal brackets no more than 8 feet apart on centers. The brackets can be an integral part of the form. If so, bolt or weld them to the form, or attach them using "clip-on" or "hook-over" brackets, provided that the form walers are bolted to the form or secure them with snap ties or shea-bolts extending through the form and ensure brackets are anchored securely. Bolt or secure folding brackets in the extended position with locking pins.

TABLE 1.11-2 Figure-Four Scaffold Dimensions

Component	Dimensions
Upright and guardrail	2×4 inches minimum
Upright and guardrail and ledger spacing	8 feet maximum
Guardrail height	Approximately 42 inches
Bearers (two)	1×6 inches minimum[1]
Braces (two)	1×6 inches minimum
Intermediate guardrail	1×6 inches minimum
Maximum ledger length	42 inches beyond form support member
Planking	2×10 inches minimum
Toe boards height	4 inches minimum

l. Ladder Jack Scaffolds

Ladder jack scaffolds shall meet the additional requirements set in 29 CFR 1926.452. Use only type 1A ladders with ladder-jack scaffolds. The combined weight of workers, planks, equipment, and materials must not exceed the rated load of the ladders. The working platform of ladder-supported scaffolds must be no more than 20 feet high. To prevent ladders from moving, secure them at the top and bottom with brackets. Only one person can occupy a ladder-jack scaffold erected with wood scaffold planks. When using fabricated planks, allow no more than two people on the plank. Design ladder-jacks so that they bear on the ladder side rails, in addition to the ladder rungs, or so that they bear on a minimum length of 10 inches on each rung. Protect employees using ladder- supported scaffolds that are 6 feet or more above the ground or floor level with safety harnesses and lifelines.

m. Suspension Scaffolds

Suspension scaffolds are platforms suspended by ropes, or other non-rigid means, from an overhead structure.

- Requirements. Suspension scaffold design and construction must meet or exceed the requirements of 29 CFR 1926.451(d) or this section, whichever is more stringent having jurisdiction. Only persons trained in operating, using, and inspecting that particular suspended scaffold can operate suspended scaffolds. Refer to 29 CFR 1926 Subpart L, Appendix A for specific guidelines regarding the requirements of 29 CFR 1926.451(d).
- Hoisting Devices and Safety Controls. Equip all suspension scaffolds (except stationary or crane supported) with either manual or powered hoisting machines. The machines must be either worm geared or powered to be able to go up and down. Design

[1] Lumber sizes for components other than planking are normal sizes.

suspension scaffolds to stop independent of manual braking; they must not move when power is not applied. Powered scaffolds must have constant pressure, nonlocking controls. Install a device to shut off the power ahead of the operating control. Design the speed control device to prevent manual release.

- Stability Control. Always control suspension scaffolds with wire rope guides or equivalent means, such as taglines, to prevent sway. Install 3/4-inch manila rope tiebacks, or equivalent, on suspension scaffolds as a secondary means of anchorage.
- Inspection and Maintenance. Prior to each work shift and after every occurrence that could affect the structural integrity, a competent person shall inspect the scaffold, including ropes, anchorage, rigging, and hoisting machines, and authorize prompt corrective actions. Maintain scaffolds and hoisting machines in safe, operable condition.
- Overhead Protection. When an overhead hazard exists, erect overhead protection of 3/4-inch exterior plywood (or equivalent strength material). Overhead protection must be no more than 9 feet above the decking.
- Restrictions. Ensure activities conducted on suspension scaffolding meet requirements of 29 CFR 1926.451 and 1926.452. Do not weld, cut, burn, rivet, or perform open flame work on staging suspended by natural fiber or synthetic rope. When using natural fiber or synthetic rope staging supports near corrosive materials, protect or treat them to prevent deterioration.

n. Platforms

- Plank-Type Platforms. Construct plank-type platforms of scaffold planks not less than 2 by 10 inches and cleated together on the underside. Install cleats within 6 inches of each end and at intervals no greater than 4 feet along planks. Platform hangers must not be more than 8 feet apart, and the planking must not extend more than 12 inches past the end hangers. Securely fasten the platform to the hangers.
- Beam-Type Platforms. Side stringers for beam-type platforms must be at least 2 by 6 inches and made of knot-free lumber set on edge. Support the flooring on 2- by 6-inch cross beams laid flat and set snugly into the top edge of stringers at intervals no greater than 4 feet. Flooring must be 1- by 6-inch lumber nailed to the supports and spaced no more than 1/2 inch apart. Hangers must not be more than 12 feet apart.
- Two-Point Suspension Platforms. Two-point suspension platforms must be of plank, beam, or metal type. Construct platforms per the requirements in this section. The platforms must be between 20 and 36 inches wide. Securely fasten platforms to the hangers with U-bolts or other equivalent means. At each elevated workstation, secure the scaffold to the building or structure to prevent sway or movement away from the wall. Do not use window cleaner's anchors for this purpose.
- Metal Platforms. Use metal platforms only if they are tested and listed by a nationally recognized testing laboratory.

o. Boatswain's Chairs

Use of single-point adjustable suspension scaffolds, or Boatswain's chairs, is prohibited.

p. Crane-Supported Personnel Platforms

Use crane-supported personnel platforms to reach the worksite only when conventional means of erection, use, and dismantling (for example, personnel hoists, ladders, stairways, aerial lifts, elevating work platforms, or scaffolding) are impossible or hazardous. Use of crane-supported personnel platforms requires specific authorization, must comply with the requirements of this section, and requires supporting justification. The written request must be specific to the operation and must (1) detail the proposed operation with supporting data that show why employees cannot safely reach the worksite using other standard procedures and (2) confirm, with manufacturing and design engineering data, that the proposed system and equipment fully comply with the requirements contained herein. Approvals will be for the specific operation described. Do not use the platform system for any other operation unless an additional request has been submitted and approved by a PE. Personnel must not work from crane-supported scaffolding except when under constant supervision of a general foreman, superintendent, or designated lift supervisor, and the crane and operation meet the requirements of this section and the section on cranes. Design, construction, and use of a crane-supported personnel platform must meet the requirements of 29 CFR 1926.1431. The use of crane-supported personnel platforms requires compliance with 29 CFR 1926 Subpart CC, Cranes and Derricks in Construction.

q. Hoist-Line Suspended Personnel Platforms

- Requirements. Keep cranes level during operation, with outriggers fully extended and jack pads set on firm, level terrain or on substantial shoring. Select sites so that, when locating cranes for platform operation, no part can come within the minimum distance from energized lines, but do not use barriers, manufacturer's locks, or control level restraints to meet these requirements. Suspend the platform only from the main boom nose. Detach the platform before rigging the crane for material handling. Engage load and boom hoist drum brakes, swing brakes, and locking devices (such as pawls or dogs) when the occupied personnel platform is in the stationary position. Employees must use personal fall protection equipment that meets the requirements of 29 CFR 1926.502, including a full body harness attached to the load block, headache ball, or a structural member of the platform. Employees must keep all body parts inside the platform during raising, lowering, and positioning.
- Restrictions. Per 29 CFR 1926.1431(k)(8), when wind speed exceeds 20 mph at the personnel platform or indications of dangerous weather create impending or existing danger, a qualified person must determine it is not safe to begin or continue operation. Do not handle materials lifts when personnel are on the platform. Do not belt off or otherwise attach a platform to an adjacent pole, structure, or equipment. Lifting and lowering speeds must not exceed 100 feet per minute. Do not move a mobile crane when employees are aloft.

r. Cranes

Install and test the crane periodically, as prescribed by the section on hoisting equipment. Use only cranes equipped with planetary or worm gears, torque converters, automatic braking systems, or other equivalent systems that prevent placing the boom hoist and load lines in a freewheeling or neutral position controlled by manual brake and/or dogs only. Use only the main hoist for personnel handling. The crane must be able to sustain a static load (as shown on the crane's capacity chart) of two times the rated platform capacity for all radii and configurations through which the platform will be hoisted. The minimum load hoist line wire rope safety factor must be at least 7 when using rotation-resistant rope. Install an anti-two- blocking device or two-blocking damage prevention feature and ensure that it is operating. The anti-two-blocking device must have automatic capabilities for controlling functions that can cause two-blocking conditions. Mark telescoping booms or equip them with a device that always shows the boom's extended length to the operator. All critical components of hydraulic or pneumatic systems must have a minimum bursting strength of at least four times the system's designed operating pressure. (Critical components are those in which a failure could result in free rotation or lowering of the boom or platform.) Equip all critical hydraulic cylinders with a pilot-operated check valve or other appropriate device to prevent freefall or uncontrolled movement of the boom or platform in the event of a hydraulic line failure. Electrical systems used for positioning platforms must provide equal protection in the event of power failure. Make sure the crane is level within 1 percent and located on firm footing. Extend and engage the outriggers.

s. Platforms

- Design. The crane manufacturer or a PE must design the personnel platform. Suspension systems must be designed to minimize tipping of the platform caused by movement of employees on the platform. The entire platform must be designed with a minimum safety factor of 5. Provide at least 6 feet of headroom for employees on the platform. Provide each personnel platform with perimeter protection from the floor to 42 inches above the floor. Perimeter protection must be either solid construction or expanded metal with openings no greater than 1/2 inch. Provide a grab rail inside the personnel platform. Access gates must swing inward and be equipped with a latch (restraining device) to prevent accidental opening. Provide overhead protection on the personnel platform when employees are exposed to falling objects.
- Use. Grind smooth all exposed rough edges that employees on the platform could contact. A certified welder must perform all welding. Conspicuously post a plate or other permanent marking on the personnel platform that shows the weight and the rated load capacity of the personnel platform. Personnel platforms must be easily identifiable by color or marking. Use personnel platforms only to hoist personnel and approved tools and equipment. Use a wire rope bridle sling to connect the personnel platform to the load line. Bridles and associated rigging for suspending the personnel platform must be used only for the platform and the necessary employees, their tools and necessary materials to do their work. The bridles and associated rigging must not have been used

for any purpose other than hoisting personnel. Close and lock hooks, headache ball assemblies, lower load blocks, or other attachment assemblies to eliminate the hook throat opening. Alternatively, use a shackle with a screw pin, nut, and retaining pin. Wire rope, shackles, rings, and other rigging hardware must have a minimum safety factor of 7.

- Additional Inspections and Tests. At the beginning of each shift, a competent person must inspect cranes used to hoist personnel platforms. In addition, a competent person must inspect the crane after it has been used for any material handling operations before it will be used to hoist employees. Before hoisting employees for the first time at each new setup location, conduct a full-cycle operational test lift at 150 percent of the intended load of the personnel platform. Immediately after lift testing, visually inspect the crane, personnel platform, and base support to determine if the testing has adversely affected any component or structure. Before further use, correct any defects found during such inspections that will create a safety hazard. At the beginning of each shift, and after using the crane to hoist materials, conduct a trial lift with the unoccupied personnel platform to make sure all systems, controls, and safety devices are functioning properly.
- Work Practices. The crane operator must always remain at the controls when the personnel platform is raised. Employees being hoisted must always remain in direct communication with the crane operator. A pre-lift meeting must be held and include the crane operator, involved employees, and the responsible general foreman, superintendent, or designated lift supervisor.

t. Aerial Lifts

Aerial lifts are devices, include any vehicle-mounted device, that telescopes or articulates in order to position personnel.

- Requirements. The design, construction, and operation of aerial lifts must comply with 29 CFR 1910.67 (general industry) or 1926.453 (construction), which incorporates ANSI A92.2, Vehicle Mounted Elevating and Rotating Aerial Devices, by reference. Mount personnel platforms on a boom only when they conform with the manufacturer's requirements. A personal fall arrest or travel restraint system shall be worn in accordance with manufacturer's instructions when in a boom or basket while working from an aerial lift.
- Controls. Articulating boom and extensible boom platforms, designed and used to position personnel, shall have both platform (upper) and lower controls. Platform controls shall be within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Lower controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

u. Safeguarding Openings in Work Surfaces

- Floor and Roof Openings. Cover floor and roof openings, including skylights into which persons can fall, with material and bracing that is strong enough to support any imposed load, or protect it with a securely anchored enclosure meeting the requirements of this section. Protect open sides of all uncovered floor or roof openings with a standard guardrail and toe board or provide a cover designed for the maximum intended load, and a minimum load of 250 pounds.
- Stairways and Ladderways. Provide all stairway and ladderway floor openings with a standard guardrail and toe board on exposed sides (except the entrance). Offset entrances to stairways or ladderways or provide a self-closing safety gate to prevent persons from walking directly into the opening. A self-closing safety gate must swing away from the opening.
- Hatchways and Chutes. Guard hatchways and chute floor openings with one of the following:

    - Hinged covers that are strong enough to carry anticipated loads and a standard guardrail with one exposed or open side. When the hatchway or chute opening is not in use, keep the cover closed or guard the exposed side with a removable standard guardrail.
    - A removable standard guardrail or self-closing gate installed on just one side, and fixed standard guardrails and toe boards on all other exposed sides. When not using the opening, keep the removable guardrails in place. Guard chute openings into which debris is manually dumped. Provide a guardrail on the side of the opening where employees stand when they dump debris.
    - Removable standard guardrails, secured to the floor on all open or exposed sides, installed to permit removal of only the portion necessary to perform the work. When the hatchway is not in use, immediately replace the guardrail and secure it.

- Doors and Gates. Provide a platform wherever doors or gates open directly on a stairway. Make sure the swing of the door or gate does not reduce the effective length of the platform to less than 20 inches.
- Walls. If there is a drop of more than 4 feet from a wall opening, and the bottom of the opening is less than 3 feet above the working surface, provide a standard guardrail or guardrail components to afford protection to a height of 42 inches above the working surface. Provide a standard toe board where the bottom of the wall opening is less than 4 inches above the working surface.
- Floors and Platforms. Guard the perimeter of all floors, platforms, etc., that are elevated 4 feet (6 feet for construction activities) or more above adjacent floor or ground level by installing standard guardrails or equivalent guarding, unless or until permanently enclosed to a height of 3 feet or more above the floor or working surface. Provide standard toe boards where falling objects pose a hazard to persons or property. In

locations where a hazardous condition exists (such as projecting reinforcing steel, moving equipment, or hazardous materials), provide standard guardrails around the perimeter of all floors, platforms, etc., regardless of working surface height.

v. Roofs

Whenever employees work on roofs during construction, demolition, or repair and maintenance and they are subject to falls exceeding 6 feet from the adjoining surface, provide adequate fall protection devices. Refer to RSHS Section 1.14 for fall protection information. Adequate fall protection is required for employees working within 10 feet of the roof edge or when working anywhere on a roof with a slope ratio steeper than 1:3.

- Warning Lines. A warning line is only acceptable on roofs with a slope ratio less than 1:3 and must be supplemented by a safety monitoring system. Warning lines must be erected around all open sides of roof work area and must meet the requirements set forth in 29 CFR 1926.502(f). Do not work outside warning lines without fall protection.
- Materials Handling and Storage at Roof Edges. When using guardrails at hoisting areas or roof-edge storage areas, erect at least 4 feet in length of guardrail on each side of the area. Place a self-closing safety gate across the opening between the guardrail sections and secure it in the closed position when employees are not handling materials. Protect employees working near the open guardrail with fall protection If roofs are more than 16 feet high, install a hoisting device, stairway, or progressive platform to supply material and equipment. Provide level landing platforms with guardrails and toe boards at the roof edge.
- Roofing Brackets. Secure roofing brackets in place with nails as well as metal projections. If it is not practical to nail the brackets, use rope supports that are 3/4- inch manila rope or equivalent.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.12 Confined Spaces and Permit Required Confined Spaces

1. Scope

This section establishes requirements for a permit-required confined space (PRCS) program for all Bureau of Reclamation facilities. It specifically discusses roles and responsibilities, training requirements, identifying PRCS, the permit system, entry procedures, and rescue protocols. This section applies to all Reclamation employees that enter or work around confined spaces at Reclamation facilities.

2. General Requirements

PRCS programs must include a confined space inventory, a permitting system, entry requirements, alternate entry procedure, atmospheric testing requirements, rescue procedures, and training. Engineering and administrative controls shall be implemented to reduce confined space hazards whenever feasible.

3. Responsibilities

a. Reclamation Safety and Occupational Health Office

- Shall provide technical support to assist regional safety managers and program coordinators with implementing the PRCS program.

b. Area Office Managers

- Shall provide necessary resources to implement and maintain the procedures in the PRCS program.
- Shall select an area office program coordinator and provide them with the authority to implement the PRCS program.

c. Program Coordinators

- Shall, in coordination with the regional industrial hygienist, recommend/purchase equipment for atmospheric testing of confined spaces.
- Shall conduct/coordinate surveys to identify, inventory/document, and assess all potential PRCSs. The written inventory must list confined spaces, specify whether they are PRCSs, and document associated and/or potential hazard(s) which must be eliminated or controlled before entry.
- Shall coordinate with facility staff to ensure a danger sign is placed at every entrance to PRCS.
- Shall review and update the list of PRCS trained employees.
- Shall provide and/or coordinate training for entry supervisors, attendants, and entrants.

- Shall provide and/or coordinate training for air monitoring of PRCSs.
- Shall coordinate with facility staff to review the PRCS program and cancelled permits on an annual basis to ensure the program is adequate and up to date.
- Shall coordinate with first-line supervisors to review job hazard analyses (JHAs) involving PRCS.
- Shall, in coordination with the entry supervisor/first-line supervisor, investigate any near misses or incidents in a confined space or when a condition outside the scope of the permit arises.
- Shall assist in coordinating on-site rescue team training and practice.

d. First-Line Supervisors

- Shall periodically observe employees entering PRCS to ensure all affected employees comply with the elements of this program.
- Shall provide/coordinate training for employees entering or working around PRCSs, including the on-site rescue team. Verify any employee entering a PRCS has applicable training prior to entry.
- Shall ensure individuals who have air monitoring responsibilities receive training on air monitoring equipment.
- Shall verify PRCS engineering and administrative controls are provided, working properly, and in good repair.
- Shall ensure hazard assessment and JHAs reflect potential PRCS hazards and document controls for each.
- Shall ensure the program coordinator is included in the review of JHAs involving PRCS.
- Shall review rescue plans in coordination with the entry supervisor and rescue team.
- Shall monitor and retain all canceled PRCS entry permits and provide to the program coordinator.

e. Entry Supervisors

- Shall assess the PRCS and understand/convey any hazards the entry team may face, including information on the mode, signs or symptoms, and consequences of the exposure.
- Shall ensure all entry permits are correctly and thoroughly completed.
- Shall, before signing the permit and allowing entry, verify all tests have been completed and documented, test results are within the acceptable entry conditions, and all procedures and equipment are in place.
- Shall verify information on chemical hazards, summarized in safety data sheets (SDS), is accessible to employees and the rescue team.
- Shall ensure there is a rescue team/service which meets the requirements of paragraph 1.12.8.f for any PRCS entry and allow work time for training and practice.
- Shall, before authorizing entry into a PRCS, verify the capability and availability of rescue team/services and the means of summoning them.

- Shall ensure rescue team members have current certifications in first aid and cardiopulmonary resuscitation (CPR) (refer to RSHS Section 1.05, Medical Services and First Aid).
- Shall authorize entry and oversee entry operations.
- Shall ensure measures are in place to remove unauthorized personnel who enter or attempt to enter the PRCS during entry operations.
- Shall terminate entry and cancel the permit when with permitted entry operations have been completed or a prohibited condition arises in or near the PRCS.
- Shall, in coordination with the program coordinator, investigate any near miss or incident in a confined space, or when a condition outside the scope of the permit arises.
- Shall ensure each rescue plan has provisions for conducting the rescue of individuals within a PRCS for each entry.

f. Attendants

- Shall understand the hazards present or likely to become present during entry, including information on the mode, signs or symptoms, and consequences of exposure, and possible behavioral effects of hazard exposure in authorized entrants.
- Shall continuously maintain an accurate count of and establish means to identify authorized entrants in the PRCS.
- Shall maintain communication with authorized entrants to monitor status and alert entrants of the need to evacuate.
- Shall continuously monitor activities inside and outside the confined space to determine if it is safe for entrants.
- Shall summon rescue and other emergency services immediately upon determining authorized entrants may need assistance to escape from PRCS hazards.
- Shall warn unauthorized persons to stay out of or exit immediately, if they have entered, the PRCS.
- Shall not perform any other duties which will interfere with the primary duty to monitor and protect entrants.
- Shall not enter the PRCS under any circumstances, including for rescues.

g. Entrants

- Shall understand the hazards present or likely to become present during entry, including information on the mode, signs or symptoms, and consequences of exposure.
- Shall use appropriate personal protective equipment (PPE) per JHA and entry permit.
- Shall maintain communication with attendants to provide status updates and alert the attendant if evacuation is necessary.
- Shall exit the PRCS as quickly as possible whenever (1) an order to evacuate is given by the attendant or entry supervisor, (2) the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, (3) the entrant detects a prohibited condition, (4) communication is lost, or (5) an evacuation alarm is activated.

h. Project Managers/Contracting Officers Representative (COR)

- Shall ensure any contractors hired to enter a PRCS provide evidence of current training for all individuals involved in the work.
- Shall inform contractors performing work in PRCSs of any potential health or other safety hazards.
- Shall confirm the contractor provides equipment, PPE, and tools necessary to complete PRCS work.
- Shall ensure the contractor provides rescue services and prior to starting work, the contractor practices rescue by means of simulated rescue operations from the actual PRCS or representative PRCS for developing a rescue plan.
- Shall notify the program coordinator of all contractor PRCS entries before work starts.
- Shall debrief contractors at the conclusion of entry operations, including a review of any hazards confronted or created during entry operations and safety procedures taken.

i. Employee Rescue Teams

- Shall practice PRCS rescues prior to entry and at least once every 12 months, by means of simulated rescue of dummies, manikins, or persons from actual PRCSs or from representative PRCSs.
- Shall develop a rescue plan and review with everyone involved in the PRCS entry.
- Shall respond immediately to rescue calls from the attendant or any person recognizing a need for rescue from the PRCS. Response capability and rapidity must meet the requirements of paragraph 1.12.6.c.(3).
- Shall receive emergency response and all training required of authorized entrants to PRCSs.
- Shall maintain current certification in first aid and CPR.

4. Training Requirements

a. Initial

Training must be outlined in the PRCS program and provided for those working as entrants, attendants, entry supervisors, and rescuers in accordance with the duties stated in this section, OSHA 1910.146, Permit-Required Confined Spaces, and OSHA 1926 Subpart AA, Confined Spaces in Construction. The initial training must cover the following topics:

- confined space regulations and definitions (General Industry and Construction),
- confined space entry hazards, both general and specific to work site,
- methods/types of entry,
- entry and exit procedures,
- air monitoring,
- roles and responsibilities for confined space entry,
- permits,

- PPE, respirators, and other safety equipment,
- identification of potential hazards,
- introduction of new hazards,
- communication equipment and procedure,
- ventilation equipment,
- lighting equipment,
- ingress and egress equipment for authorized entrants,
- barriers and shields to protect entrants from external hazards, and
- emergency procedures and rescue.

b. Refresher Training

Refresher training shall be conducted as needed to maintain employee competence in entry procedures and precautions. Retraining is required before an employee can be assigned additional confined space duties or if any of the following conditions exist:

- the employee fails to perform already assigned duties in accordance with the program,
- the employee has not performed any confined space work for a period of one year,
- changes are made in the PRCS program,
- the employee or first-line supervisor requests retraining, and/or
- the employee was involved in a near miss or incident related to PRCS work.

c. Recordkeeping

All Reclamation training records shall be kept in the Department of the Interior (DOI) official repository.

5. Hazard Identification, Assessment, and Safety Measures

a. Determination of Confined Spaces and PRCS

A flowchart for determining classification of a PRCS can be found in OSHA 1910.146 Appendix A. A space must first be identified as a confined space and then evaluated to determine if it is a PRCS. A confined space has all three characteristics below:

- is large enough and configured to allow an employee to bodily enter and perform assigned work,
- has limited or restricted means for entry or exit, and
- is not designed for continuous employee occupancy.

A confined space is classified as “permit-required” if it has one or more of the following characteristics:

- contains, or has potential to contain, a hazardous atmosphere,
- contains a material with the potential to engulf an entrant,

- an internal configuration causing an entrant to be trapped or asphyxiated, and/or
- contains any other recognized serious safety or health hazard.

b. Survey of Confined Spaces and PRCS

The program coordinator shall conduct a survey to identify confined spaces and PRCSs. The purpose of the survey is to develop and maintain an inventory of those locations and/or equipment at a facility meeting the definition of a confined space or PRCS. The initial survey shall include air monitoring, when feasible, to determine air quality in the confined spaces.

c. Site Inventory of Confined Spaces and PRCS

Each facility must maintain an inventory of confined spaces and PRCSs identifying each space in the normal operating condition and its associated hazards. Information in the inventory, including up-to-date signs on PRCSs, shall be communicated to employees by the program coordinator.

- Master Inventory of PRCS. A master inventory of PRCSs shall be maintained by the program coordinator. Any change in designation of a confined space shall be routed to all affected personnel by the program coordinator.
- Labeling of PRCS. The program coordinator in coordination with the first-line supervisor shall ensure each PRCS entrance, within their area of responsibility, is clearly labeled with a danger sign, see paragraph 1.12.9.a.
- Hazard Controls. Hazard controls shall be instituted to address hazards in work processes and/or environments associated with PRCS entry. The following order of precedence shall be employed to reduce confined space risks:

    - hazard elimination,
    - product substitution,
    - isolating hazards,
    - engineering controls (e.g., ventilation),
    - administrative controls (e.g., rotating workers, reducing worker exposure, housekeeping), and
    - PPE and air testing/monitoring equipment.

- Lockout/Tagout Requirements. All energy sources must be locked and tagged out and/or clearance applied according to the facility's Hazardous Energy Control Program (HECP), see paragraph 1.12.8.
- PPE Requirements. See paragraph 1.12.7 and RSHS Section 1.07, Personal Protective Equipment.
- Hazard Reevaluation. When changes could adversely alter conditions of the space (activities or other physical/environmental conditions), the entry supervisor and/or program coordinator shall identify and reevaluate the hazards prior to entry.

6. Pre-Job Briefing and Planning Requirements

a. JHAs

The first-line supervisor and program coordinator shall be involved in JHA planning and review. The entry supervisor shall ensure the JHA reflects site conditions and employees working on site have been fully informed of its content.

- Working Limits. The JHA must reiterate the appropriate working limits of atmospheric hazards, acceptable entry conditions, and testing/monitoring frequency and timeframe per the PRCS entry permit.
- Tunnels. If a tunnel is classified as a PRCS, the JHA shall state entry and work activities will be in accordance with PRCS requirements. JHAs for PRCS tunnel entry and underground activities must address specific hazards associated with distance, communication, physical demands, and rescue, in addition to all other confined space entry hazards.

b. Pre-Entry Hazard Assessment

A hazard assessment shall be completed by the entry supervisor and reviewed by the first- line supervisor and program coordinator prior to any entry into a confined space. No entry shall be permitted until the hazard assessment has been reviewed and discussed by all employees engaged in the activity. The hazard assessment shall identify the sequence of work to be performed, specific hazards known or anticipated, and control measures to eliminate each hazard or reduce it to an acceptable level.

c. Rescue Plan

The entry supervisor, in coordination with the rescue team, shall maintain a rescue plan with provisions for performing the rescue of individuals within a PRCS. The written plan shall be kept onsite, see paragraph 1.12.8.

- Development. The rescue team (Reclamation, commercial/municipal, and/or contractor) is responsible for developing the rescue plan. The rescue team must be provided access to spaces where they will perform recue prior to creating a job specific rescue plan.
- Review and Verification. The first line and entry supervisor must review the rescue plan and verify its adequacy before any entry into the space.
- Training. All affected personnel shall be trained on the rescue plan.

7. Personal Protective Equipment (PPE)

The entry supervisor and/or program coordinator shall determine and review PPE needed by all employees entering the confined space, including rescue teams. Contracted rescue teams shall determine and provide their own PPE.

a. Training

PRCS participants must be trained on the reason for, proper use and fit, and limitations of PPE and other safety equipment required for entry into confined spaces.

b. Selection

PPE shall be selected according to requirements of the job performed and must be documented in the JHA.

8. Safe Practices

a. Permit Systems

An entry permit is essential for assuring safety during working in PRCSs with known or potential hazards. The entry permit process guides the supervisor and workers through a systematic evaluation of the space and associated hazards.

- Entry Permits. A written entry permit must be completed and signed by the entry supervisor prior to any PRCS entry. All permits shall include:
    - identification of space to be entered and purpose of entry,
    - date/time and duration of the permit,
    - names of authorized entrant(s), attendant(s) and entry supervisor,
    - means of identifying authorized entrants inside the PRCS,
    - hazards and conditions which require immediate evacuation,
    - measures used to isolate the PRCS and to eliminate or control hazards,
    - acceptable entry conditions,
    - dates and results of initial and periodic tests performed,
    - names, initials, and signatures of testers,
    - rescue and emergency services information and means of contact,
    - communication procedures used by authorized entrants, attendant(s), and rescue team during the entry,
    - equipment provided for complying with the PRCS program,
    - additional permits issued, and
    - reason for canceling the permit.

- Permit Posting. The entry permit, and any additional permits issued to authorize work in the PRCS, shall be posted at all points of entry until the work has been completed and the permit is canceled.
- Permit Duration. The duration of the permit shall not exceed the time required to complete the assigned task identified. If a space is secured/out of service, the permit may be open indefinitely until the job task is completed. If conditions of the space and/or work change, employees must exit so it can be reevaluated.

- Issuance of New Entry Permits. If a previously permitted space must have a new permit issued, atmospheric testing must be conducted, and the results must be within acceptable limits. The entry supervisor must verify all precautions and measures called for on the previous permit are still in effect.
- Problems or New Conditions During Entry. Any problems or new conditions encountered during an entry operation shall be noted on the respective permit(s).
- Cancellation of Entry Permit. The entry supervisor must cancel entry permits when an assignment is complete or if work conditions or activities introduce a new hazard or prohibited condition. If an entry permit is cancelled prior to an assignment being completed, the confined space and hazards must be reassessed and a new permit issued before work can recommence.
- Recordkeeping. Cancelled permits shall be retained for one year and a copy sent to the program coordinator. Cancelled permits shall not be dispositioned until after review by the program coordinator.

b. Entry Procedure

When entry into a PRCS is necessary, the entry supervisor must review and sign the completed entry permit and initiate entry procedures.

- Additional Permits. Any use of chemicals, welding, soldering, or cutting must be outlined in the JHA. Additional permit(s) for such work must be obtained and approved by the entry supervisor, see 1.12.8 for permit posting.
- Opening a PRCS. Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.
- Protecting PRCS Openings. When entrance covers are removed, the PRCS opening shall be promptly guarded by railing, temporary cover, or other temporary barrier preventing anyone from accidentally falling through the opening and/or foreign objects from entering the space. Railings shall meet applicable requirements of OSHA 1926.502 (Construction) or 1910.28 (General Industry).
- Ventilation. All PRCSs shall be ventilated naturally or by mechanically forced air ventilation to ensure atmospheric hazards are reduced to a safe level for entry.
- Lighting. Ensure appropriate lighting is used for the PRCS atmospheric conditions and provides adequate illumination to safely conduct work.
- Atmospheric Testing. Atmospheric testing is required prior to entry into a PRCS. Initial air sampling must be conducted at the entrance, at various levels within the space (top, middle, bottom, and around conduits, pipes and cables), and in various areas of the space (corners and center) to determine the oxygen level and detect the presence of combustibles and toxins. A remote probe is acceptable, and intrinsically safe equipment must be used if a flammable atmosphere is suspected or present. The internal atmosphere shall be tested with a calibrated, direct-reading instrument, in the following order:

  - oxygen content,
  - flammable gases and vapors,
  - potential toxic air contaminants.

- Air Monitoring. Air monitoring shall be conducted for the duration of entry. Periodic results shall be documented on the entry permit according to the timeframe established in the JHA. All air monitoring equipment must be calibrated and maintained according to manufacturer's specifications.
- Acceptable Limits. The entry supervisor must evaluate test data for hazardous atmospheres in the PRCS and verify acceptable conditions for entry exist. The atmosphere is considered within acceptable limits when the conditions of Table 1.12-1 are maintained. Any space with an atmospheric condition recognized as immediately dangerous to life or health (IDLH) is not acceptable for entry.

TABLE 1.12-1 Acceptable Conditions of Hazards

Hazard	Acceptable Condition
Oxygen	Pre-entry: 19.5%-23.5% Working: 19.5%-23.5%
Combustible gas	<10% of the lower explosive limit
Toxic gases and vapor substances	<OSHA permissible exposure limit
Carbon monoxide (CO)	Pre-entry: ≤12 ppm Working limit: ≤ 50% of PEL (25 ppm)
Hydrogen sulfide (H_2S)	Pre-entry: ≤5 ppm Working limit: ≤50% of PEL (10 ppm)
Airborne combustible dust	Industry Practice (See OSHA Annotated Table Z-1 for regulatory limits)

c. Alternate Entry Procedure

- Conditions. Alternate entry procedures may be used for entering a PRCS under the following conditions:

  - Hazards. The entry supervisor, in coordination with the program coordinator, can demonstrate the only hazard is an actual or potential hazardous atmosphere.
  - Controls. The entry supervisor, in coordination with the program coordinator, can demonstrate continuous forced air ventilation alone is enough to maintain the permit space is safe for entry.
  - Monitoring Data. Monitoring data must support the above demonstrations and made available to each entrant. If an initial entry is necessary to obtain this data, the entry shall be performed in compliance with a PRCS permit.

- Entrance Covers. Conditions where it is unsafe to remove an entrance cover shall be eliminated before the cover is removed. When the cover is removed, the opening shall be promptly guarded with a barrier which will prevent falling through the opening and falling objects from entering the space.
- Pre-Entry Testing. Prior to entering, the internal atmosphere shall be tested with calibrated direct-reading instruments in the following order: for oxygen content, flammable gases and vapors, and for potential toxic air contaminants.
- Ventilation. Continuous forced air ventilation shall be used to eliminate any hazardous atmosphere. Ventilate the immediate areas where entrants are or will be and continue until all entrants have exited the space. Air supply shall be from a clean source and not add hazards. Periodically test to ensure ventilation is preventing accumulation of hazardous atmosphere.
- Hazards. If hazardous atmosphere is detected during entry, entrants shall leave the space immediately. The space shall be reevaluated to determine the source and appropriate controls for any subsequent entry. No hazards, such as potential engulfment or serious safety hazards, other than actual or potential hazardous atmosphere, may exist in the space. Employees shall not enter until it is demonstrated for the program coordinator and entry supervisor that no other known hazards exist and adequate hazard controls have been implemented.
- Controls. Employees shall not enter the space until it is demonstrated for the entry supervisor the air ventilation alone maintains a safe atmosphere. Physical hazards not locked out, removed, etc., are considered eliminated.
- Methods. Methods for satisfying the above demonstration requirements may include, but are not limited to, appropriate air changes, smoke tube testing, air monitoring data, and exposure data.
- Monitoring and Results. Air monitoring must be conducted before entry and while ventilating the space. Monitoring results must be documented prior to entry and periodically as mentioned in the JHA and as needed for the job task being performed. Results must be documented in the alternate entry verification.
- Entrants. Entrants must be trained and qualified both to serve as PRCS entrants and use air testing and monitoring equipment.
- Verification. The entry supervisor must prepare and sign an alternate entry verification to certify the conditions have been met. The verification statement must identify the space, purpose of entry, time of entry, and entrants.
- Posting and Archiving. The verification statement must be posted at the point of entry and must be kept in the program coordinator’s office after the entry is completed.

d. Reclassification of a PRCS

A PRCS without an actual or potential hazardous atmosphere may be reclassified as a non-permit required confined space if all other hazards can be eliminated without entry. If the space

must be entered to eliminate the non-atmospheric hazards, this must be done under permit before the space can be reclassified.

- Space Conditions. Controlling atmospheric hazards through forced-air ventilation is not considered elimination. Conditions in the space shall be periodically verified and documented. If hazards arise, each employee must exit and the entry supervisor must reevaluate to determine whether the space must be reclassified as a PRCS.
- Documentation. The entry supervisor must document the basis for determining all hazards in the PRCS have been eliminated, through a certification which contains the date, location of the space, a description of how the hazards have been eliminated, and the entry supervisor's signature.
- Duration. The certification shall be made available to each employee entering the space and is valid for the duration of the job task. The document must be kept in the program coordinator's office for one year after entry has been completed.

e. Evacuation

Evacuation is necessary if the attendant detects a prohibited condition, behavioral effect on an entrant from exposure to a hazard, a situation occurs outside the space which could endanger the entrant(s), or the attendant cannot safely and effectively perform their duties.

f. Provisions for Rescue

All PRCS entry permits must include a plan for rescuing the entrants; see paragraph 1.12.6. The rescue plan shall meet the tiered rescue modes and times (see Table 14-2) set by National Fire Protection Association (NFPA) 350, Guide for Safe Confined Space Entry and Work, paragraph 10.1.3.4 (2019 edition). Rescue teams shall be a designated group of employees or a contracted commercial/ municipal service.

- Rescue Response Modes. The degree and rapidity of response must consider both anticipated hazards of the space and technical aspects of moving an ill or injured entrant to a stable environment. Rescue capabilities shall be evaluated by the program coordinator and entry supervisor to ensure they are appropriate for the potential complexity and response. If an entrant becomes incapacitated and requires extraction, the rescue team must be capable of response and entry within the times listed in Table 1.12-2, Rescue Times by Response Mode.

TABLE 1.12-2 Rescue Times by Response Mode

Response Mode	Response Time to Site	Time for Rescue Setup and Entry
Tier 1	5 minutes	15 minutes
Tier 2	On-site	12-15 minutes
Tier 3	On-site	2 minutes

- Retrieval Systems for Non-Entry Rescue. Mechanical retrieval systems shall be available and ready when an authorized person enters a PRCS, unless such equipment increases the overall risk of entry or would not contribute to the rescue of the entrant.

    - Configuration. Retrieval systems shall include a lifting device, anchor, chest or full-body harness, wristlets, if appropriate, and a retrieval line attached at the center of the entrant's back near shoulder level or above the head. If harnesses are not feasible, or would create a greater hazard, wristlets may be used. Retrieval systems shall be in the rescue plan.
    - Installation/Operation. The retrieval line shall be firmly fastened outside the space so rescue can begin as soon as retrieval is necessary. A mechanical device shall be available to retrieve personnel from vertical confined spaces more than 5 feet deep.

- Employee Rescue Teams. Rescue teams shall be a designated group of employees trained, evaluated, and equipped to enter PRCSs to rescue an incapacitated entrant. Prospective employee rescue teams must be evaluated per OSHA 1910.146(k) and demonstrate proficiency with rescue-related tasks and equipment, while rescuing entrants from the specific PRCS.

    - Pre-Entry Review. Before entry, the entry supervisor must verify both an adequate number of rescue team members are immediately available and all rescue team members have current training.
    - Exercise the Rescue Plan. Rescue teams shall exercise the rescue plan by practicing from the actual PRCS or a representative PRCS at least once every 12 months. Representative PRCS shall, with respect to opening, size configuration, and accessibility, simulate the types of actual emergency rescue to be performed.
    - Rescue Summons. The procedure for summoning the rescue response must be established on the entry permit, and the attendant(s) must have the communication equipment and be trained in the procedure for summoning rescue services.

- Non-Reclamation Rescue Service. Prospective rescue services must be evaluated per OSHA 1910.146(k) prior to selection. Additional rescue service evaluation criteria are available in OSHA 1910.146 App F, Rescue Team or Rescue Service Evaluation Criteria.

    - Pre-Entry Review. The entry supervisor, in coordination with the program coordinator, must (1) verify the selected rescue service is qualified to perform the rescue, (2) inform the rescue service of hazards associated with the confined space, and (3) provide access to all PRCSs they will rescue from as to develop appropriate rescue plans and practice rescue operations.

- Rescue Summons. The procedure for summoning the rescue response must be established on the entry permit, and the attendant(s) must have the communication equipment and be trained in the procedure for summoning rescue services.

g. Non-Reclamation Entrants

- Coordination of Work. If confined spaces are to be entered by contractors, either alone or in conjunction with Reclamation employees, the project manager/COR in coordination with the program coordinator is responsible for coordinating the work. When both Reclamation and contractor personnel are working in or near PRCSs, entry operations must be coordinated to avoid endangering any personnel.
- Hazard Information. The project manager/COR in coordination with the program coordinator shall inform all contractors performing work in PRCSs of any potential health or safety hazards.
- Debrief. The project manager/COR in coordination with the program coordinator shall debrief the contractor at the conclusion of entry operations, including a review of any hazards confronted or created during entry operations and safety procedures taken.

h. Isolation and Lockout/Tagout (LOTO) Safeguards

All energy sources that are potentially hazardous to the PRCS entrants shall be secured, relieved, disconnected, and/or restrained before entry. Equipment systems or processes shall be locked out and/or tagged out as required by the HECP. Any removal of locks, tags, or other protective measures shall be done in accordance with the facility HECP or LOTO Program.

i. Ingress and Egress Safeguards

Means for safe entry and exit shall be provided for confined spaces and PRCS. Each entry and exit point shall be evaluated by the entry supervisor and/or program coordinator to determine effective methods and equipment enabling employees to safely enter and exit the space, see section 1.12.8.

9. Communication Requirements

a. PRCS Signage

All PRCS access points shall have posted danger signs identifying the space. The danger signs shall contain warning language stating entry is prohibited except to authorized personnel and a permit is required before entry. Danger signs shall be maintained in a legible condition.

b. Entry Communication

PRCS attendants must have an established means of communication with all entrants, rescue team/services, and emergency services. The means of communication must be stated in the JHA and entry permit.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.13 Control of Hazardous Energy (Lockout/Tagout)

1. Scope

This section establishes requirements for safely controlling hazardous energy, commonly known as "lockout/tagout," during operations involving Bureau of Reclamation (Reclamation) employees working at Reclamation-owned, -controlled, or -occupied facilities and construction sites. This section applies to all sources of hazardous energy. For additional guidance on working safely with electrical energy, see Reclamation Safety and Health Standard (RSHS) Section 1.10, Electrical Safety Requirements.

2. General Requirements

a. Occupational Safety and Health Administration (OSHA) Regulations

This section is intended to meet the hazardous energy control requirements of 29 CFR 1910.147, The control of hazardous energy (lockout tagout), 29 CFR 1910.269, Electric power generation, transmission, and distribution, 29 CFR 1910.333, Selection and use of work practices, 29 CFR 1926.417, Lockout and tagging of circuits, and 29 CFR 1926.961, Deenergizing lines and equipment for employee protection.

b. Reclamation Operations

All Reclamation-owned, -controlled, or -occupied facilities and construction sites shall implement Facilities Instructions, Standards, and Techniques (FIST) Volume 1-1, Hazardous Energy Control Program.

c. Construction Contractor Operations

All construction contractor operations at Reclamation-owned, -controlled, or -occupied facilities and construction sites shall follow the requirements of FIST Volume 1-1, 29 CFR 1926.417, and 29 CFR 1926.961.

3. Responsibilities

a. Area Office Manager

- Shall implement FIST Volume 1-1 at all facilities and construction sites.
- Shall develop a facility hazardous energy control program (F-HECP) as required by FIST Volume 1-1 at all facilities and construction sites.

b. Project Manager/Acquisitions

- Shall include statements in all applicable project specifications, solicitation packages, and contracts for the contractor to follow the requirements of FIST Volume 1-1 and applicable F-HECP.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.14 Fall Protection

1. Scope

This section sets forth safety standards and work practices for all Bureau of Reclamation employees who are working at elevated levels, exposed to fall hazards, and/or using fall protection equipment to prevent falls from overhead platforms, elevated workstations, or into holes in the floor. The Occupational Safety and Health Administration (OSHA) requires that fall protection be provided at heights of 4 feet in general industry workplaces and 6 feet in construction industry workplaces. Reclamation requires the use of fall protection for all work performed at heights of 4 feet or greater. In addition, fall protection must be provided when employees are working over dangerous equipment and machinery, regardless of the fall distance. When the potential fall hazard into dangerous equipment is within 4 feet, protection must be provided by a guardrail or fall restraint system (unless the equipment is covered and guarded). When the potential fall hazard into dangerous equipment is at or greater than 4 feet, protection must be provided by guardrail, safety net, fall restraint, or fall arrest systems.

2. General Requirements

A personal fall protection system must be in place to protect employees who work on slopes steeper than 1-1/2:1 (horizontal: vertical), who work on unstable footing, or who could fall from heights greater than 4 feet (if not protected by fixed scaffolding, guardrails, or safety nets). Fall arrest systems have very specific requirement to catch a fall at or just past the 4 feet mark (when fall protection is required). Manufacturer's guidance regarding anchor points should be followed for all fall hazards, including when clearance to a lower level is at 4 feet. Typically, this means the anchor point must be above the dorsal D-ring and almost directly above the employee utilizing the fall arrest. A false sense of security can easily be gained at (or just past) the 4 feet requirement. Therefore, it is important to consider other options before donning a fall arrest system (especially when there is only 4 feet of clearance to the lower level). Furthermore, excluding ladder fall arrest systems, fall arrest systems are not designed to catch a person when a fall is less than 4 feet. If these systems are utilized below 4 feet, contact with the lower level will occur during the fall before the system can catch the person experiencing the fall. However, these requirements do not apply to rope-supported work (high angle work), such as high scaling, geologic mapping, structural inspections, or other operations that require specialized rope equipment or techniques (see paragraph 1.14.8., "Rope Access Safety Requirements").

3. Responsibilities

a. Reclamation Safety and Occupational Health Office

- Shall provide Reclamation-wide oversight and direction for Fall Protection Programs.

- Shall conduct reviews and evaluations of Fall Protection Programs and modify policies and procedures as needed.
- Shall aid in the development and training of Fall Protection Programs.

b. Regional/Area Office Program Coordinators

- Shall provide region-wide direction and oversight for administration of an appropriate Fall Protection Program.
- Shall serve as the focal point for program development and implementation in the regions.
- Shall provide technical advice to Safety Managers and Collateral Duty Safety Representatives.

c. First-Line Supervisors

- Shall assist management in implementing the Fall Protection Program and providing training and education for employees.
- Shall assist management in identifying personnel with potential for occupational exposure to falls and help conduct or coordinate appropriate training programs.
- Shall assist management in the development of all fall protection plans when standard railings and personal fall arrest systems are not feasible.
- Shall assist management in reviewing and updating programs as needed.
- Shall provide employees with appropriate fall protection equipment and personal protective equipment (PPE).

d. People Doing the Work

- Must participate in required training programs every other year.
- Shall be familiar with requirements of this section and the facility's Fall Protection Program.
- Must wear appropriate PPE and observe appropriate work practice controls.
- Must report all unsafe conditions and fall hazards to supervisors or managers.

e. Regional Safety Manager

- Shall provide professional safety and health services necessary to meet program expectations.
- Shall assist with and/or monitor Fall Protection Programs.
- Shall arrange training about Fall Protection Programs.
- Shall review other RSHS sections for fall protection requirements.

4. Training Requirements

a. Initial

Before using fall protection equipment, each worker who might be exposed to fall hazards from heights must be trained by a competent person who is qualified to deliver fall protection training. Such training will include the recognition of fall hazards, application limits of the equipment, proper hookup, anchoring, and tie-off techniques, methods of equipment inspection and storage, and use of rescue equipment and rescue procedures.

b. Refresher/Recertification

The refresher for all personnel involved in Fall Protection Programs shall be in accordance with the requirements prescribed in the American National Standard Institute's ANSI/ASSP Z359.2, Minimum Requirements for a Comprehensive Managed Fall Protection Program.

c. Proficiency Qualification

Training of all personnel involved in Fall Protection Programs, including the program manager, qualified persons, competent persons, end users, authorized and competent rescuers, and any associated fall protection trainers, shall conform to ANSI/ASSP Z359.2 and ANSI/ASSP Z490.1, Criterion for Acceptable Practices in Safety, Health and Environmental Training.

5. Hazard Identification, Assessment, and Safety Measures

a. Procedures

Whenever a fall hazard is identified or present, a hierarchy of fall protection shall be considered. This hierarchy shall include (1) hazard elimination, which includes changing the work methodology such that the fall hazard no longer exists; (2) passive fall protection, including physical barriers that prevent access to unprotected edges (e.g., guardrails and covered holes); (3) fall restraint systems designed to restrict a workers movement so prevent fall hazard; and (4) administrative controls designed to increase a worker's awareness of a fall hazard.

- Proper Use. Use personal fall protection systems and their components only for employee fall protection. Inspect lifelines, lanyards, belts, hardware, and anchorages at the beginning of each day they will be used and discard questionable devices. Use and care of fiber lifelines and lanyards will be according to manufacturer's instructions, recommendations contained in the Hoisting and Rigging Safety Manual of the Infrastructure Health and Safety Association, or the procedures stated within this section, whichever is most protective.
- Lifelines. Lifelines shall only be used for employee safeguarding. When using vertical lifelines, each employee must be provided with a separate lifeline. Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,000 pounds. Any lifeline subjected to in-service

loading, as distinguished from static load testing, shall be immediately removed from service and shall not be used again for employee safeguarding.

- Rescue. Make provisions to promptly rescue employees who fall or provide the means for self-rescue within 4–6 minutes.
- Protection. Protect lifelines from being cut, abraded, or damaged in any way.
- Maintenance, Inspection, and Testing. All personal fall protection systems must be used by following the manufacturer's recommendations for maintenance, inspection, and testing.

b. Personal Fall Arrest System

A fall arrest system for an employee who might fall from a working level must consist of an anchorage, connectors, and a body harness. The system may also include a lanyard, deceleration device, lifeline, or a suitable combination of these. Fall arrest systems shall not allow a person to fall more than 6 feet (or contact a lower level). The fall arrest systems are allowed to operate per OSHA standard 29 CFR 1910.140(d)(2)(ii), which states that a free fall may be more than 6 feet provided the employer can demonstrate the manufacturer designed the system to allow a free fall of more than 6 feet and tested the system to ensure a maximum arresting force of 1,800 pounds is not exceeded.

- Performance Criteria. Personal fall arrest systems must have a label specifying that they meet the appropriate ANSI/ASSP Z359 standards.
- Use. Rig personal fall arrest systems to prevent an employee from falling more than 4 feet in general industry or more than 6 feet in construction industry or from contacting any lower level. Employees must wear a personal fall arrest system with the attachment point of the body harness in the upper center of the back, between the shoulder blades. When employees are connected to a horizontal lifeline that could become vertical, the lifeline connectors must be able to lock in either direction on the lifeline.
- Maintenance. Maintenance is a critical element in personal fall arrest systems. Follow manufacturer's recommendations. At least one competent employee must be available to inspect and maintain personal fall arrest systems.
- Annual Inspection. At least once a year, a competent person will inspect and document all fall arrest systems and components for wear, damage, or deterioration in accordance with the manufacturer's instructions. Per OSHA standard 29 CFR 1910.28(b)(9), no new ladder cages may be installed. By November 18, 2036, all fixed ladders above 24 feet must have a fall arrest system.
- Impact Loading. When a personal fall arrest system has been subjected to shock loading, immediately remove it from service until a competent person inspects it and determines that it is suitable for reuse.

c. Positioning Device System

Positioning device systems include equipment or hardware that, when used with a body harness, supports an employee on an elevated vertical surface (such as a wall or a rebar mat) and allows both hands freedom of movement. Positioning device systems also include devices attached between the employee and an anchorage to prevent an accidental fall from an elevated surface.

- Performance Criteria. Positioning device systems must withstand, without failure, a 4-foot drop of a 250-pound weight.
- Performance Test. Positioning device systems comply with performance requirements if they meet the test contained in OSHA standard 29 CFR 1926 Subpart M, Appendix D. Restraint line systems must be designed to meet the same test requirements as other positioning device systems.

d. Personal Fall Protection Systems for Ladder Climbing

Employees will wear, or must be attached to, personal fall protection systems to prevent injuries and falls when climbing a fixed ladder over 24 feet without a cage.

- Design Criteria for System Components. The system must permit an employee to ascend or descend the ladder with both hands free for climbing, without having to hold, push, or pull any part of the system. The connection between the carrier or lifeline and the point of attachment to the harness must be no more than 9 inches long. The system must activate within 2 feet after a fall.
- Performance Criteria. Ladder safety devices and their support systems must withstand, without failure, an 18-inch drop of a 500-pound weight. All other personal fall protection systems for climbing activities must withstand, without failure, a 4-foot drop of a 250-pound weight.
- Installation. Attach mountings for both rigid and flexible carriers at each end of the carrier. Attach intermediate mounting as necessary along the entire length of the carrier to provide the strength necessary to stop employee falls. When the system is exposed to wind, install cable guides used with a flexible carrier every 25 to 40 feet along the entire length of the carrier to prevent wind damage to the system. The design and installation of mountings and cable guides must not reduce the design strength of the ladder.

e. Requirements for Linemen's Harnesses and Lifelines

- Linemen's Equipment (Arc Rated Harnesses). The full body harness used around high voltage equipment or structures will be an industry-designed linemen's arc rated harness with either straps or plastic-coated D-rings and position side D- rings in lieu of exposed metal D-rings and exposed metal positioning side D-rings. All other exposed metal parts (e.g., buckles and adjusters) of the linemen's harness will also be plastic coated.
- Nonconductive Rope Lifelines. Nonconductive rope lifelines must have a minimum breaking strength of 5,000 pounds and be able to withstand an alternating current

dielectric test of at least 25,000 volts per foot “dry” for 3 minutes without visible deterioration.

6. Pre-job Briefing and Planning Requirements

Before starting a job that involves fall hazards, submit a Job Hazard Analysis (JHA) that is compliant with RSHS Section 1.04.5 to the Contracting Officer’s Representative or the appropriate office lead. The JHA must address, at minimum, the following additional items:

- emergency procedures, including medical assistance,
- PPE required, including hand, eye, and head protection (for individuals exposed to fall hazards, adequate head protection is required whenever a fall arrest system is employed),
- a description of the equipment to be used for duty,
- a description of the hardware inspection process to be completed before using the equipment,
- methods for ensuring safe entrance and exit from the worksite,
- procedures for protecting employees and the public from falling materials, and
- provisions for rescue, including both rescue by onsite personnel and/or arrangements for rescue services by offsite personnel.

7. PPE

Appropriate control measures will be implemented through the hierarchy of controls (i.e., elimination, substitution, engineering controls, warnings, administrative controls, and personal protective equipment) to reduce the hazard of falls to an acceptable level of risk. The use of fall protection PPE described in this subsection will be considered only if the other controls in the hierarchy are unavailable or infeasible.

a. Head Protection

Head protection must provide lateral impact protection, as a side impact could result from a fall, and must provide protection throughout a fall. Hard hats conforming to ANSI Z89.1 requirements, for Type II hard hats with an integrated chinstrap, must be used.

b. Full Body Harness

Only full body harnesses that have a label specifying that they meet the requirements of ANSI/ASSP Z359 are acceptable. Full body harnesses labeled to meet the requirements of ANSI A10.14 will not be used. Load-bearing straps will have a minimum width of 1-5/8 inches and develop a breaking strength of not less than 5,000 pounds.

- Hardware. Connectors must be drop forged, pressed, formed steel, or equivalent materials. Connectors must have a corrosion-resistant finish, and all surfaces and edges

must be smooth to prevent damage to interfacing parts of the system. D-rings, O-rings, snap hooks, and carabiners must be able to sustain a minimum tensile load of 5,000 pounds. D-rings, snap hooks, and carabiners must be proof tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or incurring permanent deformation. Snap hooks and carabiners must be self-closing, self- locking, and capable of being opened only by two or more consecutive, deliberate actions. Only snap hooks and carabiners meeting a gate strength of 3,600 pounds in all directions, per ANSI/ASSP Z359, Fall Protection and Fall Restraint, will be used.

- Personal Fall Arrest Systems. Personal fall arrest systems require the use of a full body harness. The use of body belts is not acceptable.
- Attachment Point. The fall arrest attachment point on the full body harness will be integrally attached and located at the wearer's upper back, between the shoulder blades (dorsal D-ring). A frontal D-ring attachment point integrally attached to the full body harness and located at the wearer's sternum can be used for fall arrest if the free fall distance does not exceed 2 feet and the maximum arresting force does not exceed 900 pounds (i.e., used with a ladder climbing device).
- Suspension Trauma Prevention. All full body harnesses will be equipped with suspension trauma preventers, such as stirrups, relief steps, or similar components, to provide short-term relief from the effects of orthostatic intolerance. All full body harnesses must have suspension trauma straps.

c. Lanyards and Lifelines

- Lanyards and vertical lifelines that tie off one employee must have a minimum breaking strength of 5,000 pounds. Self-retracting lifelines and lanyards that automatically limit free fall distance to 2 feet or less must have components that can sustain a minimum static load (tensile load) of 3,000 pounds applied to the device with the lifeline or lanyard fully extended. Self-retracting lifelines and lanyards that do not limit free fall distance to 2 feet or less, rip stitch lanyards, and tearing and deforming lanyards must be able to sustain a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard fully extended. A competent or qualified person must inspect each knot in a lanyard or vertical lifeline to ensure the breaking strength and tensile load requirements of this paragraph are met.
- A qualified person must design, install, and supervise the use of horizontal lifelines as part of a complete personal fall arrest system that maintains a safety factor of at least 2.
- Restraint lines must be able to sustain a tensile load of at least 3,000 pounds. Lifelines and carriers must not be made of natural fiber rope. Synthetic rope such as nylon, polyester, or polypropylene must contain an ultraviolet light inhibitor.

8. Other Safety Equipment

a. Anchorages

For fall arrest, anchorages must be able to support at least 5,000 pounds per attached employee or must be designed, installed, and used under the supervision of a qualified person as part of a complete fall protection system that maintains a safety factor of at least 2. For rescue and work positioning, anchorages must be able to support 3,000 pounds and travel restraint support of 1,000 pounds. De-energized conductors, insulators, and nonstructural components in switchyards or on transformers, circuit breakers, or other components will not be used as anchorage points.

- Rebar. Anchorages will not be made from drill steel or reinforcing bar.
- Mobile Anchorages. Anchorages must not be made to mobile equipment or other items that can move while the anchorage is in use.

b. Rope Access Safety Requirements

The requirements in this section do not apply when an employee performs rope-access work on high-angle slope or vertical environments where the rope is the primary means of support and where the employee must manipulate the rope and its attachments while using industrial rope-access techniques to obtain access to the work area. These situations include such work as high scaling, geologic mapping, rock bolting, structural inspections, construction, operations, and maintenance activities. The Reclamation Rope Access Board ensures all rope-access operations are conducted in a safe and consistent manner. Consult the latest version of Reclamation's Guidelines for Rope Access Work. Permit rope-access work only when other means of access are not feasible or when methods other than rope- access work expose employees to greater danger.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.15 Hand Tools, Power Tools, Pressure Vessels, Compressors and Welding

1. Scope

This section sets forth the requirements for the operation and maintenance of hand tools, power tools, pressure vessels, compressors, chainsaws, and welding equipment. These requirements apply to both shop-based and mobile equipment. Reclamation employees that use or work around these equipment types must follow the requirements of this section.

2. General Requirements

All welding and cutting operations shall comply with 29 CFR Subpart O, Welding, Cutting and Brazing, by following the current edition of American National Standards Institute (ANSI) Z49.1, Safety in Welding, Cutting, and Allied Processes. All tools or equipment must be evaluated for noise levels and follow Reclamation Safety and Health Standard (RSHS) Section 2.07, Hearing Loss Prevention Program.

3. Responsibilities

a. Facility Manager—Welding

- Shall ensure their facility has a written hot work operations plan, per RSHS Section 1.09, Fire Prevention and Protection.
- Shall designate, in writing, the authorizing individual for hot work permitting, as well as for authorizing cutting and welding operations for areas not specifically designed for hot work.
- Shall ensure that permanently designed hot work areas in their facility are identified.

b. Facility Manager—Pressure Vessels

- Shall maintain a log or recordkeeping process for pressure vessel inspections and permits per Facilities Instructions, Standards, and Techniques (FIST) Manual 2-9, Inspection of Unfired Pressure Vessels.
- Shall schedule all pressure vessel inspections at least every 5 years per FIST Manual 2-9.
- Shall ensure a current permit is hanging on the pressure vessel or prominently displayed close to the pressure vessel.

c. First-Line Supervisors—General

- Shall ensure that each employee can safely perform the work tasks and operate the tools, equipment, and machines used in their jobs.

- Shall provide employees with personal protective equipment (PPE) and equipment for tasks as determined by the job hazard analysis (JHA).

d. First-Line Supervisors—General

- Shall ensure that each employee can safely perform the work tasks and operate the tools, equipment, and machines used in their jobs.
- Shall provide employees with personal protective equipment (PPE) and equipment for tasks as determined by the job hazard analysis (JHA).

e. First-Line Supervisors—Welding

- Shall ensure all hot work is conducted per the hot work permit, including establishing controls for designated areas for cutting and welding based upon the fire potentials of the plant or facility where hot work will happen, including ensuring flammable substances are not in the spark zone of any welding activities.
- Shall ensure hot work equipment is appropriate for the type of hot work performed.
- Shall advise contractors of hazardous conditions in hot work areas.

f. First-Line Supervisors—Compressed Gas

- Shall ensure the handling, storage, and utilization of all compressed gases in cylinders, and portable tanks are in accordance with Compressed Gas Association Pamphlet P-1-1965, which is incorporated by reference as specified in 29 CFR 1910.6.
- Shall ensure that compressed gas cylinders are visually inspected prior to use in accordance with the most recent Compressed Gas Association Pamphlet C-6.
- Shall ensure compressed gases are transported according to 49 CFR Parts 171-179 and 14 CFR Part 103.
- Shall ensure employees complete the training requirements listed in paragraph 1.15.4.c, Compressed Gas Training of this RSHS.
- Shall remove unsafe compressed gas cylinders from service until repaired.

g. First-Line Supervisors—Hand Tools

- Shall ensure the safe condition of tools and equipment.
- Shall ensure employees are trained on all tools, equipment, and machines used in their job, in accordance with paragraph 1.14.4 Training Requirements of this RSHS before employees operate or maintain said equipment.
- Shall ensure all tools are stored properly at the end of each work shift.
- Shall ensure damaged or defective tools are tagged and removed from service until repaired. If the tool cannot be repaired, a competent employee must destroy the tool so it cannot return to service.

i. First-Line Supervisors—Power Tools

- Shall keep the manufacturers owner's manual for all machinery and equipment under their control or shall provide a procedure to document deficiencies/hazards for machinery or equipment where a manufacturers owner's manual cannot be obtained.
- Shall ensure employees are trained in accordance with paragraph 1.15.4.c, Training Requirements of this RSHS, before employees operate and maintain equipment.
- Shall ensure all tools are stored properly at the end of each work shift.
- Shall ensure safe condition of tools, by ensuring damaged or defective tools are tagged and removed from service until repaired. If the tool cannot be repaired, a competent employee shall destroy the tool so it cannot return to service.

j. Employees—General

- Shall follow all requirements of this section.
- Shall wear PPE identified in the JHA.

4. Training Requirements

a. Initial—Hand and Power Tools

Before initial use, employees shall be trained by the supervisor or an assigned on-the-job trainer on all machinery or equipment they are required to use. Only trained personnel or those in supervised on-the-job training shall operate shop machinery or equipment unless they pass a proficiency check by their first-line supervisor. Proficiency and training on one kind of hand or power tool does not imply an employee is proficient and trained on all hand or power tools. Each tool or type of tool requires separate consideration.

b. Initial—Chainsaws

Training shall meet the requirements established in consensus standard ANSI-OPEI B175.1 (2021 Edition) Outdoor Power Equipment – Internal Combustion Engine-Powered Hand- Held Chain Saws – Safety and Environmental Requirements. Training shall:

- be provided at no cost to employees,
- be provided prior to the employee performing chainsaw-related work,
- be provided whenever the employee is assigned a new task, tools, or equipment,
- cover the safe performance of assigned work,
- cover safe use, operation, and maintenance of tools, including an emphasis on understanding and following the manufacturer's operating and maintenance instructions, warnings, and precautions,
- cover recognition of safety and health hazards associated with the employee's specific work tasks, including the use of measures and work practices to prevent and control those hazards,

- include first aid training for all employees required to use chainsaws in the performance of their duties,
- be documented in the form of a written certification that contains the name of the employee trained, the dates of training, the signature of the person who conducted the training, and the signature of the supervisor, and.
- refresher or recertification training whenever an employee demonstrates unsafe performance.

c. Initial—Compressed Gas Training

Employees that use, handle, store, transport, or ship compressed gases shall be trained on the following minimum elements:

- RSHS Section 1.19, Hazard Communication Program, 1.19.4.a, Initial Training, on the hazards of compressed gases used at the facility and the associated compressed gas equipment,
- handling and use procedures,
- storage procedures,
- required PPE,
- gas-specific safety procedures,
- shipping procedures as applicable,
- transport procedures as applicable, and
- compressed gas emergency procedures

d. Training—Welding

Welders must be trained to the level of work they are performing (e.g., American Welding Society, ANSI). The facility manager shall determine if it is appropriate for an apprentice to work under a certified welder or to become certified to meet a certain standard.

e. Refresher—General

When work duties or conditions change in the facility, first-line supervisors shall provide employees refresher training.

f. Lack of Proficiency—General

Retraining is necessary when an employee demonstrates a lack of knowledge of the training elements identified in paragraph 1.15.4 of this RSHS.

g. Recordkeeping—General

All training records shall be kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01). A summary of employee's training relating to this section shall be easily and quickly accessible at

the employee's assigned duty station and a copy provided to the job lead/facility manager when the employee reports to another duty station for temporary or detail work.

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment—Compressed Gas

The first-line supervisor, with the assistance of a safety professional if needed, shall identify the types of compressed gases, work areas, and storage areas. First-line supervisors shall ensure that a JHA is developed in accordance with paragraph 1.15.6.a, Job Hazard Analysis (JHA) of this RSHS. First-line supervisors shall ensure employees are trained per paragraph 1.15.4 of this RSHS.

b. Safety Measures—Compressed Gas

- Prohibited Work Activities. The first-line supervisor shall ensure employees working with compressed gases never perform the following forbidden practices:

    - attempt to repair a cylinder, pressure relief device, or valve,
    - store acetylene cylinders on their side,
    - store cylinders containing oxygen, acetylene, or fuel gases in confined spaces,
    - bleed a cylinder to below 25 psi,
    - set the acetylene regulator above 15 psi,
    - roll or drag cylinders,
    - tamper or disable safety devices on cylinders or cylinder accessories,
    - mix gases in a cylinder or try to refill a cylinder; always contact the supplier for this,
    - use the recessed top of the cylinder as a storage area for tools or materials,
    - open valves until regulators are drained of gas and pressure-adjusting devices are released,
    - point outlets towards employees or sources of ignition when opening cylinders,
    - use the valve or valve cap to lift the cylinder,
    - use oxygen and compressed air interchangeably, and/or
    - permit smoking or open flame sources where cylinders are stored.

6. Pre-Job Briefing and Planning Requirements

a. Job Hazard Analysis (JHA)

The first-line supervisor and the employees doing the work shall conduct a Risk Assessment and JHA planning and review, and shall ensure the written JHA includes appropriate handling, use, inspection, storage, and transport procedures for job tasks. First-line supervisors shall ensure a post-job JHA review is conducted per RSHS Section 1.04, Work Safety Planning. First-line supervisors shall verify an employee has the competency to utilize the tools and equipment to do their job, at a level sufficient to meet the hazards identified in the JHA.

b. Hot Work Permit

Shall comply with RSHS Section 1.09, Fire Prevention and Protection. Any hot work conducted outside of a designated hot work area requires to have a hot work permit.

c. Pressure Vessels

FIST Manual 2-9, Inspection of Unfired Pressure Vessels, provides inspection and testing guidelines for pressure vessels including pre-job planning and considerations. First-line supervisors shall consult FIST 2-9 prior to any job involving a pressure vessel.

7. Hazardous Atmosphere

When a hazardous atmosphere develops or exists, all work will immediately cease until the atmosphere has returned to acceptable conditions, as referenced in RSHS Section 1.12, Confined Spaces and Permit-Required Confined Spaces.

8. Personal Protective Equipment (PPE)

The first-line supervisor shall ensure employees have the appropriate PPE identified in the JHA for their job tasks and have been trained on proper PPE use per RSHS Section 1.07, Personal Protective Equipment.

a. Additional Welding or Hot Work Operations PPE

Additional PPE is required for welding operations per RSHS Section 1.07, Personal Protective Equipment.

b. PPE Requirements When Operating Chainsaws

When operating chainsaws, employees must use the following PPE:

- long sleeved shirt and long pants,
- cut-resistant or leather, laced 8 inches (204mm) high, boots that provide ankle support and nonskid soles (hard toes are optional),
- hard hat or cutting helmet meeting ANSI Z89.1,
- ANSI Z87.1 clear safety glasses, at a minimum or equivalent, mesh “bug- eye” type or mesh face shield type,
- hearing protection required for gasoline powered chainsaw use,
- gloves or chain saw mitts made of leather when sharpening chainsaw blades (alternative style of gloves may be used for inclement weather conditions, based on the JHA),
- chaps or cut-resistant pants for chain saw use shall meet the requirements of the most current version of ASTM F-1897, overlapping boots at least 2 inches, and
- additional PPE as identified by local conditions or identified in a local JHA.

9. Other Safety Equipment

a. Fire Extinguishers

Fire extinguishers rated 2A:40B:C units or larger must be immediately available in areas of hot work.

10. Safe Practices

a. Welding/Hot Work

Each employee performing welding/hot work shall have a copy of, and follow, the hot work permit. The hot work permit and hot work operations shall follow the requirements of RSHS Section 1.09, Fire Prevention and Protection. Employees shall:

- ensure the hot work permit remains in place until the work is complete, and
- obtain training per paragraph 1.15.4.d of this RSHS.

b. Compressed Gas Handling

- The first-line supervisor shall ensure employees are aware of and use the following work practices when handling compressed gases:
    - wear the appropriate PPE identified in the JHA when handling or working around compressed gases,
    - examine cylinders as soon as received for damage or leakage,
    - use carts, dollies, or other material handling equipment designed to secure cylinders to move cylinders,
    - ensure protective valve caps are securely fastened on cylinders when idle or being transported,
    - ensure cylinders are equipped with valves, hoses, connectors, and regulators and all are in good condition prior to use,
    - check the cylinder's label before putting the cylinder into service to ensure the correct gas is being used,
    - perform a leak check immediately after compressed gas cylinder(s) are connected to equipment or systems,
    - place a warning tag on damaged or leaking cylinders and move to a safe area until the supplier removes the cylinder,
    - use regulators, pressure relief devices, valves, hoses, and other auxiliary equipment specifically designed for the container and compressed gas/cryogenic liquid to be used,
    - close cylinder valves when cylinders are in storage, in transit, or not in use,
    - ensure the valve wrench or wheel is in the operating position when cylinder is in use,
    - handle cylinders properly to not weaken or damage the cylinders or valves,

- roll cylinders on the bottom rim during short displacements,
- never subject cylinders containing compressed gases to temperatures above 125 degrees Fahrenheit,
- when transporting or moving compressed gas cylinders with a crane, hoist or derrick, ensure the cylinders are placed in a cradle, net, or skip, and
- Never transport compressed gas cylinders by slings, chains, or magnets.

- Employees shall:

  - attend initial training as described in paragraph 1.15.4.c, Compressed Gas Training of this RSHS,
  - attend refresher training as described in paragraph 1.15.4.e, Refresher Training of this RSHS,
  - conduct visual gas cylinder inspections prior to use and shall immediately report any leaking, damaged, or malfunctioning cylinders to their first-line supervisor,
  - never use any leaking, damaged, or malfunctioning cylinders, and
  - review the JHA before handling, using, storing, or transporting compressed gases, and shall follow all identified precautions and risk minimization protocols.

- Compressed Gas Storage. The first-line supervisor shall ensure employees are aware of and use the following work practices when storing compressed gases:

  - separate stored oxygen cylinders from fuel-gas cylinders and combustible materials by a minimum distance of 20 feet; or by a noncombustible barrier that is at least 5 feet high and has a minimum fire-resistance rating of .5-hour.
  - for cutting and welding operations, store or use a single cylinder of a fuel gas and a single cylinder of oxygen without separating the cylinders, so long as the cylinders are:

    - on an approved cart designed to secure and move cylinders,
    - connected to regulators enabling them to be ready for service,
    - equipped with an apparatus designed for cutting or welding, and
    - valves are closed when the work is finished, or the cart must be moved.

  - store cylinders in dry, well-ventilated areas away from exits and stairways,
  - store cylinders off the ground,
  - keep out of direct sunlight and keep temperatures below 125 Fahrenheit when storing cylinders outside,
  - ensure cylinders containing flammable or oxidizing gases are not stored near ignition sources or combustible materials, especially oil or grease,
  - ensure a properly rated and sized fire extinguisher is available where compressed gases are stored and one is close by when using flammable compressed gases,

- store cylinders upright and secure cylinders properly (e.g., bracket, chain) while in storage or during transit,
- ensure cylinder valve caps are securely in place when the regulator is disconnected from the cylinder (e.g., storage, transport),
- store empty and full cylinders in separate areas,
- ensure empty cylinders are labeled/marked with a tag indicating “empty” or “MT,”
- ensure cylinders are stored in areas away from contact with extreme temperatures (e.g., heating elements, cryogenic liquids) and/or corrosive materials, and
- do not use oxygen or other compressed gases as a substitute for compressed air.
- welding carts must not be utilized for cylinder storage:
- in construction settings (fuel gas and oxygen located on a welding cart must either be in-use, or ready-to-use, within 24 hours), and
- in an industrial setting, covering most Reclamation operations (fuel gas and oxygen located on a welding cart must either be in-use, or ready-to- use within 30 calendar days).

- Safe Use of Compressed Gases. The first-line supervisor shall ensure employees are aware of and use the following work practices when using compressed gases:

  - always keep removable caps and valve outlet caps/plugs on containers except when connecting to dispensing equipment,
  - ensure that employees that use or store oxyfuel-gas containers for welding, cutting, and other similar activities are trained per this RSHS,
  - ensure the valve wrench or wheel is in the operating position when the cylinder is in use,
  - always open cylinder valves slowly and never to the fully open position,
  - keep fuel gas and liquid cylinders upright and away from heat, sparks, fire, or electrical circuits,
  - separate all compressed gases (e.g. flammables and oxidizers) by type and compatibility. Exception: for cutting and welding operations, employees may store or use a single cylinder of a fuel gas and a single cylinder of oxygen without separating the cylinders, as long as the cylinders are:

    - on an approved cart designed to secure and move cylinders,
    - connected to regulators enabling them to be ready for service,
    - equipped with an apparatus designed for cutting or welding; and
    - valves are closed when the work is finished, or the cart must be moved.

  - keep oxygen cylinders and fittings free of oil or grease,
  - do not use oxygen cylinders with oily hand or gloves,

  - do not direct oxygen at oily surfaces, greasy cloths, or into a container, storage tank, or vessel,
  - ensure the cylinder valve is fully shut off when gas is not in use, and
  - ensure that cylinders are firmly secured using a mounted bracket and chains.

- Transporting Compressed Gases. The first-line supervisor shall ensure employees transporting compressed gases have the appropriate training for transporting compressed gases on public roads or highways, according to U.S. Department of Transportation (DOT) regulations 49 CFR Parts 171-179 for hazardous materials. The first-line supervisor shall ensure employees that transport compressed gases on public roads or highways have properly placarded the vehicle per DOT regulations.
- Material and Warning Signage for Compressed Gases. Warning signs (e.g., DANGER, NO SMOKING, NO OPEN FLAME, NO IGNITION SOURCES) are required in areas where fuel gases are used or stored. Stored cylinders must be signed in compliance with Table 1 of ANSI Z53.1-1967 or Table 1 of ANSI Z535.1- 2006(R2011), per the requirements set forth in 1910.145(d)(2) through (d)(6).
- Hand Tools. Employees shall:

  - replace or dispose hand tools with mushroomed heads,
  - keep cutting edges sharp so tools move smoothly without binding or skipping,
  - replace broken or fractured handles on hand tools, or dispose them,
  - store tools when not in use,
  - store tools in a dry, secure location,
  - replace or dispose worn or bent wrenches,
  - use the appropriate handles on hand tools,
  - service jacks on a regular basis,
  - lubricate jacks at frequent intervals, and
  - never use jacks beyond their rated capacity.

- Powder-actuated Tools. Use of portable powder-actuated tools must comply with the following:

  - powder-actuated tools must be left unloaded until ready for use,
  - powder-actuated tools shall be inspected for obstructions or defects prior to use, and
  - powder-actuated tools shall be stored individually and in a locked container when not in use.

- Portable Powered Tools. Use of portable powered tools must comply with the following:

  - powered tools must have the appropriate machine guarding,

- manufacturer machine guarding shall not be tampered with, adjusted beyond original specifications, or in any way altered to bypass any portion of the guarding or safety features,
- abrasive wheel machines (e.g., hand grinders, cut-offs) must have safety guards which cover the spindle, nut, and flange projections and the guards must be mounted to maintain proper alignment with the wheel. Maximum revolutions per minute (rpm) rating of each abrasive wheel must exceed the rpm rating of the motor it is installed on,
- abrasive wheel machines must have a built-in on/off control switch,
- employees must ring test new abrasive wheels before mounting,
- bench and pedestal grinders must be permanently mounted,
- dust collectors and powered exhausts must be provided on mounted grinders that produce large amounts of dust or fine particles, and
- grinders that use coolant must have mounted splash guards.

- Extension cords and transferred potential. Electrical conductors near Reclamation power facilities can pose a severe electric shock hazard due to electrical transferred potential during a power system ground fault. This typically occurs when a person standing outside of a powerplant, pumping plant or switchyard ground grid touches an electrical conductor connected to the ground grid during a power system ground fault. This shock hazard exists when working with a corded tool outside the plant or switchyard fence with an extension cord plugged into an electrical outlet located within the powerplant, pumping plant or switchyard. Double insulated tools alone do not provide protection against electrical transferred potential due to the high voltages that could be present. Using battery powered tools or pneumatic tools (with non-conducting hoses) eliminates the electrical transferred potential shock hazard. See IEEE Std 80-2013 section 17.9 for additional details.

11. Use and Maintenance

a. Hand Tools, Power Tools, and Chainsaws

When using hand tools, power tools, and chainsaws employees shall:

- use, inspect, and maintain the tool in accordance with the manufacturer's instructions and recommendations,
- only use the tool for its intended purpose/use,
- have a copy of the manufacturer's instructions and recommendations with the tools, as applicable,
- inspect tools periodically during a task or work shift to ensure safe operating conditions,
- ensure tools are in good repair and required safety devices or guards are installed and properly adjusted, and

- have guards on power tools equipped per manufacturer's requirements and guards are fully functional.

b. Hand Tools

Employees shall:

- inspect all hand tools before use, and
- Immediately turn in any damaged or defective tools to their first-line supervisor.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.16 Hazardous Materials Emergency Response

1. Scope

This section applies to all Bureau of Reclamation (Reclamation) facilities that store and use hazardous substances. This section should not be confused with Occupational Safety and Health Administration (OSHA) 29 CFR 1910.38, Emergency Action Plans.

2. Responsibilities

a. Area Office Managers and Facility Managers

- Shall use the criteria outlined in paragraph 1.16.4.b, Emergency Response Plan, to determine if Reclamation facilities require an Emergency Response Plan as prescribed in 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response. Area Managers shall contact their local environmental protection specialists for guidance when available.

b. Local Safety Professionals

- Shall assist facility managers and supervisors who use or store hazardous chemicals or substances in determining the relevant criteria in 29 CFR 1910.120 and 29 CFR 1910.1200.
- Shall assist supervisors in the development and review of local Hazard Communication and Emergency Response Plans, upon request.

c. First-Line Supervisors

- Shall develop and maintain written Emergency Response Plans, when required, and update at least annually. The local hazardous material coordinator or local safety professional will review the Emergency Response Plans at least annually.
- Shall provide employees with training to understand their responsibilities within the Hazard Communication Plan and Emergency Response Plan.

3. Training

a. Initial

The supervisor must provide training to employees with potential exposure to incidental releases of hazardous substances to meet the requirements contained in the Hazard Communication Standard, 29 CFR 1910.1200, Hazard Communication.

b. Emergency Response

Supervisors will provide training for employees who participate, or will participate, in emergency responses in accordance with 29 CFR 1910.120.

4. Safe Practices

a. Incidental Release

Reclamation defines an incidental release as a release of a hazardous chemical or substance which does not pose a significant safety or health hazard to employees in the immediate vicinity or to employees assigned to clean up the incidental release. An incidental release does not have the potential to become an emergency within a short time frame. Incidental releases are limited in quantity, exposure potential, and toxicity.

- Examples.
    - Hazardous substances stored in very small quantities that do not pose a significant safety and health threat based on the volume or toxicity.
    - Hazardous substances easily contained by employees in the immediate vicinity that are cleaned up using absorbent materials without posing a threat to the safety and health of employees.
    - Employees readily repairing, or safety staff repairing, a small leak at a later time (i.e., the safety and health of the employees are not threatened if the employee does not initiate an immediate response).

b. Emergency Response Plan

29 CFR 1910.120(q) requires emergency response plans for situations involving hazardous substances or chemicals, including the following:

- emergency responders coming from outside the immediate release area,
- the evacuation of employees in the immediate area,
- potential conditions that are immediately dangerous to life or health,
- a serious threat of fire or explosion, or
- high levels of exposure to toxic substances.

Requirements. Reclamation facilities requiring employees to respond to hazardous substance releases or spills that meet the above criteria must also adhere to the provisions outlined in 29 CFR 1910.120(q). Supervisors and managers must contact their regional industrial hygienist if they feel they have employees or conditions that would warrant adherence to 29 CFR 1910.120(q).

c. Area and Facility Manager Decision Guide

- Exempt Facilities. Reclamation facilities that do not contain hazardous substances or hazardous chemicals of any kind are exempt from Federal OSHA requirements prescribed in 29 CFR 1910.1200, as well as 29 CFR 1910.120.
- Small Quantity. Reclamation facilities that maintain small quantities of easily- controlled hazardous substances or chemicals (e.g., gasoline, cleaning products or solvents, oils,

lubricants), are required to adhere to the requirements prescribed in Reclamation Safety and Health Standard Section 1.19, Hazard Communication Program, and 29 CFR 1910.1200. Federal OSHA CPL 02-02-073 defines small quantities as pint size or less.

- Highly Toxic Chemicals. Facilities that store or use highly toxic chemicals known to be an immediate threat to life or health shall adhere to the requirements outlined in Reclamation Safety and Health Standard 1.19, 29 CFR 1910.1200, and 29 CFR 1910.120(q), Emergency response program to hazardous substance releases, based on the criteria outlined in paragraph 1.16.4.b.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.17 Lone Worker and Remote Worker Safety

1. Scope

This section sets forth requirements for the lone and remote worker safety program. This section shall be used for all Reclamation employees who work or travel alone or who work in remote locations with limited or non-existent communications, or locations with limited emergency service response. If a contractor has lone or remote workers, the contractor must establish their own lone worker and remote worker safety program. The contractor's safety plan shall include the contractor's lone worker and remote worker safety program.

2. Responsibilities

a. Reclamation Chief, Safety and Occupational Health

- Shall review these section every 3 years, or more frequently as needed.
- Shall respond to policy and programmatic discrepancies in a timely manner.

b. Regional Safety Managers

- Shall assist supervisors and managers in the establishment, use, and maintenance of localized lone worker and remote worker safety programs.

c. Area Office Managers

- Shall develop and implement a lone worker and remote worker safety program in their office if they have employees who perform work as outlined in paragraph 1.17.1, Scope, of this section.
- Shall provide all needed equipment, systems, check-in protocols, and other resources necessary to implement a lone worker and remote worker safety program.
- Shall ensure that supervisors perform the minimum requirements of this section.

d. Regional Managers, Division Managers, or Denver Office Division Managers

- Shall direct their field-going employees to comply with local lone worker and remote worker safety plans for field-going work at/on Reclamation facilities or lands within the area office having responsibility.
- Shall develop and implement a lone worker and remote worker safety program for all field-going work within their jurisdiction not otherwise covered by an area office plan (e.g., work on other Federal lands, work on tribal lands).
- Shall provide all needed equipment, systems, check-in protocols, and other resources necessary to implement lone worker and remote worker safety program requirements.
- Shall ensure supervisors within their jurisdiction perform the minimum requirements of this section.

e. Supervisors

- Shall account for their lone and remote workers in the field or at remote sites.
- Shall maintain a daily check-in process for lone and remote workers.
- Shall identify the required and available emergency services during the risk assessment and/or job hazard analysis (JHA) process.
- Shall make a determination during the risk assessment and/or JHA process if the field-going employee(s) will be within a limited emergency services response area.
- Shall develop a contact plan and emergency services response plan in collaboration with field-going employee(s).
- Shall notify their appropriate manager(s) immediately of any field-going employee who has missed their check-in time and the supervisor is unable to contact the employee.
- Shall ensure their employees comply with the applicable lone worker and remote worker safety program.

f. Local Safety Professional/Collateral Duty Safety Representative

- Shall assist supervisors and field-going employees in conducting risk assessments, hazard analysis, and planning for lone and remote work.

g. Employees

- Shall follow the requirements of this section and the applicable lone worker and remote worker safety program.
- Shall plan their work in collaboration with their supervisor or acting supervisor to assess the risks and hazards of the work they will perform. Shall consult their local safety professional/collateral duty safety representative if additional expertise is needed.
- Shall check-in with their supervisor as required by these procedures.
- Shall notify their supervisor or acting supervisor of any variation or change to their lone worker or remote worker plan as soon as possible.

3. Training Requirements

Supervisors shall provide employees with training on the applicable lone worker and remote worker safety program including the relevant hazards and how to effectively mitigate those hazards. Supervisors shall provide employees who work in remote locations with training in first aid, at a level appropriate to the risk, and cardiopulmonary resuscitation. Supervisors shall ensure employee's certifications are current per Reclamation Safety and Health Standard (RSHS) 1.05, Medical Services and First Aid, paragraph 4, Training Requirements. Supervisors shall train employees to use emergency communication and location devices as identified in the applicable lone worker or remote worker program.

4. Hazard Identification, Assessment, and Safety Measures

In addition to the JHA, supervisors shall conduct a written risk assessment and identify potential hazards for all lone and remote work (Reference RSHS Section 1.04, Work Safety Planning). The supervisor shall document hazard mitigation or elimination measures. The supervisor shall evaluate security risks or concerns during this process.

5. Pre-job Briefing and Planning Requirements

Before departing, the employee(s) will review the lone or remote worker plan and communicate any changes to their supervisor. The employee will ensure they have all safety equipment necessary. The employee and supervisor must establish a contact plan and an emergency services response plan prior to starting the work.

6. Hazardous Environmental Conditions (Weather/Other)

The JHA should include information about potentially hazardous weather or environmental conditions. If hazardous conditions are expected to pose additional risks, supervisors and employees should consider delaying the work or implementing adequate mitigation measures.

7. Safe Practices

a. Emergency Equipment

Employees shall ensure they have adequate two-way communication equipment in the field as indicated in the applicable lone worker and remote worker safety program. If warranted and when available, employees shall check out a satellite phone to provide another means of contact. Employees shall take emergency locators, transmitter devices, or satellite emergency notification devices to the field as identified by the JHA or risk assessment, particularly when other forms of communication, such as radios or cell phones, have limited or non-existent coverage. Supervisors shall provide other safety emergency equipment to employees as identified by the JHA or risk assessment. Employees must test selected communication equipment before the start of operations to verify that the equipment will operate efficiently in the environment, as referenced in RSHS Section 1.04.8.b, Communications.

b. Contact Plan

The contact plan will state the date, time, and method of check-in communications between the employee(s) and their supervisor. The plan will include procedures regarding employee(s) missed check in(s) and the steps for an alternative means of contact. The plan will also state the steps to alert first responders and/or emergency services to search for the employee(s) when communication cannot be made with the employee(s). The plan will state at what point the supervisor will notify the appropriate manager(s), and who will contact emergency services or first responders.

- Minimum Requirements. The contact plan shall include the following information, at a minimum:

    - name and all contact information of employee(s) conducting lone or remote work,
    - name and phone number(s) of supervisor or acting,
    - daily check-in dates, times, and time zones for employee(s) to contact the supervisor or acting, and
    - time to wait before activating the emergency services response plan and notifying their appropriate manager(s).

- Additional Information. When available, the contact plan should include the following:

    - contact information for persons or entities close to the remote location, as a secondary method for contacting lone or remote workers, and
    - make, model, color, and license plate of the vehicle(s) used by the employee(s).

c. Emergency Services Response Plan

Supervisors shall put an emergency services response plan in place prior to lone or remote work. Supervisors shall use the emergency services response plan if a lone or remote worker has missed a check-in and the supervisor cannot establish contact. At a minimum, the plan shall include:

- the scheduled location of the lone or remote worker,
- contact information of the emergency services or first responders for the area(s) the employee is located,
- any critical information about the employee(s) that first responders would need to know,
- any critical information first responders need to know to access the area and to locate the employee, and
- the make, model, color, and license plate of the vehicle(s) being used by the employee(s), if available.

d. Prohibited Activities for Lone Workers

Lone workers are prohibited from activities too hazardous to perform alone. The risk and hazard analysis process shall identify any prohibited activities. The supervisor shall communicate the prohibited activities to the employee before work begins.

8. Aerosol Defensive Sprays (ADS)

a. Manager Approval

Local managers may authorize employees to carry and use ADS in the following situations (Note: The use of pepper guns and pepper ball launchers is prohibited):

- circumstances or functions related to official duties warrant added personal protective measures against potential violent attacks from humans or animals
- employees operating within the scope of their employment on Reclamation lands or other lands and properties under the control of the Bureau of Reclamation,
- designated employees have successfully complete ADS training, and
- approval for employees to carry and use ADS has been identified in a risk assessment and/or JHA signed by the local manager.

b. Expiration of ADS Approval

Employee approval to carry ADS will expire under the following conditions:

- at the end of each calendar year,
- upon completion of a specific project or activity where ADS was authorized for limited use,
- upon change of duty station, status, or transfer,
- upon failure to demonstrate competent and prudent use of ADS, and/or
- whenever such authorization has been revoked by the local manager.

c. Training

Only those employees who have successfully completed an ADS safety course and demonstrated ability in its use are authorized to carry and use ADS. Local managers shall ensure the unit develops an ADS safety course with a field practicum for employees designated to carry and use aerosol defensive sprays. The course shall include the following, at a minimum:

- active ingredient(s) in ADS, such as oleoresin capsicum,
- effects of ADS on wild and domestic animals and humans,
- types of ADS and capabilities,
- how to defend oneself using ADS,
- storage and transportation requirements, including shelf life,
- procedures for readying, carrying, and using ADS,
- medical considerations and treatment for ADS exposure,
- decontamination procedures where ADS has been utilized,
- animal behavior and habitat,
- reporting procedures,
- instructor demonstration in the use of ADS and
- proper disposal of ADS per manufacturer’s instructions.

d. Instructor Qualifications

Persons designated to provide ADS safety course instruction shall successfully complete a course sponsored by an ADS manufacturer or a recognized instructor in the use of ADS or an equivalent training course or a local manager shall appoint the instructor based on

demonstrated knowledge and experience before convening training. Instructors shall also possess knowledge in animal behavior and habitat.

e. Course Completion Certification

Instructors shall provide designated employees, who have successfully completed an ADS safety course, documented evidence of completion, such as a certificate or equivalent. The immediate supervisor shall maintain training records in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in the Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

f. Refresher Training

A refresher training course is required every 2 years and shall include the minimum requirements prescribed in paragraph 1.17.8.c. of this section.

g. Transportation and Storage

The following applies to ADS:

- ensure ADS has not expired,
- shall not be carried or transported aboard commercial aircraft at any time,
- may be transported aboard Reclamation leased or contracted aircraft provided the ADS is securely stored in an approved safety container,
- may be transported in Reclamation-owned, leased, or contracted motor vehicles provided the ADS is securely stored in an approved safety container,
- shall be stored in a manner that limits access to authorized personnel only,
- shall be stored at room temperature,
- Shall not be stored near heat sources or open flames, nor placed in areas that subject ADS to extreme temperatures, such as glove boxes, vehicle trunks, or on a dashboard,
- shall not be carried or transported while off duty,
- shall not be stored in an employee’s residence, and
- shall be stored in an approved safety container in the employee’s office, shop, facility, or temporary lodging facility.

h. Reporting Procedures

Below are the reporting procedures involving the use of ADS.

- Any employee who discharges ADS in the commission of official duties shall notify their immediate supervisor as soon as possible. The immediate supervisor may request the employee to provide a brief narrative of the incident as a follow-up to the initial notification.
- The employee's immediate supervisor shall report the incident to the appropriate local manager as soon as possible.

- The local manager shall determine if additional actions are needed to be taken to ensure a safe work environment for their employees.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.18 Life Safety Code Program

1. Scope

This section establishes the responsibilities and procedures for the Life Safety Code Program (Program) at all Bureau of Reclamation (Reclamation) owned and operated facilities, Reclamation operated construction sites, and at all transferred works as stipulated by the applicable contracts. The primary goal of this section is to support the comprehensive and consistent implementation of the Program across all regions within Reclamation.

2. General Requirements

The Program facilitates compliance with the Occupational Safety and Health Administration (OSHA) 29 CFR 1910 Subpart E, Exit Routes and Emergency Planning, National Fire Protection Association (NFPA) 101, Life Safety Code (LSC), and other applicable codes as required.

All Reclamation employees and contractors must use the latest edition of nationally recognized codes per U.S. Code Title 40, Subtitle II, Part A, Chapter 33, Section 3312, Compliance with Nationally Recognized Codes. The latest edition of LSC contains provisions for existing, renovated, and new buildings.

3. Responsibilities

a. Director of Mission Assurance and Protection Organization

- Shall be the executive sponsor for the Program.
- Shall, as needed, assign the Authority Having Jurisdiction Team (AHJT) to perform special assignments.
- Shall consult with regional directors and Denver directors to maintain appropriate representation on the AHJT.
- Shall designate a facilitator for the AHJT

b. Regional Directors

- Shall assign the responsibility of Authority Having Jurisdiction (AHJ) for the Program within their region.
- Shall delegate LSC authority by designating an AHJ for the region. The AHJ must be a senior management level position with expertise in engineering, architecture, or LSC. Reclamation permits no further delegation.

c. Denver Directors

- Shall provide personnel and financial resources to maintain capabilities to support LSC subject matter experts.

d. Area and Facility Managers

- Shall execute the Program and promote compliance with LSC within their area/facility.
- Shall ensure qualified personnel conduct and report LSC inspections within the requirements of this section and Reclamation Safety and Health Standard (RSHS) Section 1.23, Safety Inspection and Abatement.
- Shall engage the AHJ in LSC questions, concerns, or ambiguities as needed or as required by this section and the LSC.
- Shall mitigate LSC deficiencies and findings within their area/facility.

e. Project Managers and Designers

- Shall ensure each project is LSC compliant.
- Shall engage the AHJ in LSC concerns as needed or as required by this section and LSC.
- Shall ensure the design summary includes dates and list of codes used to address the LSC compliance.

f. Construction Engineers, Construction Inspectors, and Contract Officers

- Shall ensure construction satisfies LSC aspects of design.
- Shall coordinate any LSC changes with the AHJ and/or designer.

g. AHJ

- Shall enforce the requirements of the LSC.
- Shall interpret the LSC and issue determination memorandums as outlined by this section and NFPA 101 paragraph 4.6.1.
- Shall develop a regional LSC report, if applicable, and provide the report to the regional safety manager for inclusion in annual safety reports.
- Shall participate on the AHJT.
- Shall complete training required by this section.
- Shall serve as AHJ or code official for other codes as applicable.

h. AHJT

- Shall conduct team meetings at least annually or more frequently as needed.
- Shall maintain this section.
- Shall advise on LSC related policies, guidelines, training, etc.
- Shall propose outreach methods to increase Reclamation's LSC awareness.
- Shall provide guidance to each regional AHJ for consistent interpretation of the LSC.
- Shall form ad-hoc teams to address specific issues, as needed.
- Shall complete training required by this section.

i. AHJT Facilitator

- Shall chair, coordinate, and facilitate AHJT meetings.

- Shall maintain collection of AHJ determinations and code interpretation documentation.
- Shall provide an annual program briefing to the Director, MAPO.
- Shall maintain a list of the current AHJs on Reclamation's Safety website. (https://www.usbr.gov/safety/directory/ahj.html)

j. Regional Safety Managers

- Shall engage the AHJ in LSC concerns as needed.
- Shall provide LSC status updates, as applicable, in the annual safety report.
- Shall complete training required by this section.

k. Area Safety Managers

- Shall complete the LSC inspection checklist while completing facility safety inspections.
- Shall engage the AHJ in LSC concerns as needed.
- Shall attend an NFPA 101 implementation course either online or in a classroom setting.
- Shall enter LSC inspection and LSC assessment findings in Safety Management Information System (SMIS) Inspection Abatement System (IAS).
- Shall track and update the status of LSC findings in IAS.
- Shall complete training required by this section.

l. Safety Professionals

- Shall complete the LSC inspection checklist while completing facility safety inspections.
- Shall engage the AHJ in LSC concerns as needed.
- Shall complete training required by this section.

4. Training Requirements

a. Initial

- AHJs, AHJT, and Regional Safety Managers. The AHJs, AHJT members, and regional safety managers shall attend the multi-day NFPA 101 LSC Essentials live virtual or in-person training course or equivalent multi-day LSC course.
- Area Safety Managers and Safety Professionals. Area safety managers and safety professionals shall attend a LSC implementation course either online or in a classroom setting, such as the NFPA 101 LSC Essentials online training series.

b. Refresher/Recertification

AHJs and AHJT. The AHJs and AHJT members shall attend the multi-day NFPA 101 LSC Essentials live virtual or in-person training course or equivalent multi-day LSC course every second LSC update cycle (every 6 to 8 years).

c. Recordkeeping

Reclamation shall keep records in the Department of the Interior's approved repository and manage records in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Safe Practices

a. Inspections

- Facilities and Frequency. The area manager shall ensure qualified personnel conduct and document LSC inspections for all facilities under their control on the following frequency:

    - occupied facilities annually, and
    - normally unoccupied facilities every 5 years.

- Conducting Inspections. The safety professional shall conduct a LSC inspection when conducting facility safety inspections in accordance with the requirements of RSHS 1.23.
- Inspection Checklist. The safety professional shall use the IAS LSC inspection category for all LSC inspections to provide consistency. Appendix 1.18A, Life Safety Code Questions, of this RSHS, includes the IAS LSC inspection category questions for reference.
- Disputed Findings. The safety professional and facility personnel shall make every effort to reach consensus on any disputed LSC inspection findings. If they cannot reach a consensus, facility personnel shall elevate the disputed LSC inspection finding(s) to the AHJ.

b. Assessments

- Requesting Assessments. The AHJ, area manager, facility manager, project manager, or regional safety manager shall, as needed, request subject matter experts to conduct and document LSC assessments of Reclamation facilities or design projects in response to an incident, LSC inspection, changes to facility occupancy or construction, project design requirements, or a specific concern.
- Conducting Assessments. Subject matter experts shall conduct and document requested LSC assessments.
- Compliance with LSC. Subject matter experts shall conduct LSC assessments based upon LSC requirements in NFPA 101.
- Findings. Subject matter experts shall discuss LSC assessment findings with facility management or project management prior to leaving the facility and/or finalizing the assessment report. The area manager shall ensure hazards identified at existing facilities are mitigated in accordance with the requirements of RSHS 1.23.
- Disputed Findings. Subject matter experts and facility or project personnel shall make every effort to reach consensus on any disputed LSC assessment findings. If they

cannot reach a consensus, facility or project personnel shall elevate the disputed LSC assessment finding(s) to the AHJ.

- Assign Risk Assessment Codes (RAC). Subject matter experts shall assign a RAC for each LSC assessment finding to assist management with prioritization of resources to abate the most critical findings. The subject matter experts shall follow the requirements of RSHS 1.23 when assigning a RAC for each LSC assessment finding.
- Report. The subject matter expert shall distribute the LSC assessment report and any associated documentation to the AHJ, area manager, facility manager, project manager, regional safety manager, area safety manager, AHJT facilitator, and Reclamation Safety and Occupational Health Office electronically within 120 calendar days of the last day of the assessment site visit, unless justifiable delays exist and are documented with the assessment requestor.
- Record Findings in IAS. The area safety manager shall, as needed, enter the LSC assessment findings identified at existing facilities into IAS by updating existing LSC inspection findings or entering the findings as nonquestion-based discoveries within 30 calendar days after receiving the LSC assessment report.
- Track Findings. The area safety manager shall track and update the LSC assessment findings identified at existing facilities in accordance with requirements of RSHS 1.23.

c. Determination Memorandum

- Request Memorandum. The area manager, facility manager, project manager, or regional safety manager shall request an AHJ determination memorandum when an LSC requirement is being mitigated through a method that does not meet all compliance requirements of the LSC and/or through a method that is not detailed in the LSC.
- Request Submittal. The facility manager, area manager, project manager, or regional safety manager shall submit a determination memorandum request to the AHJ in writing. The request should include the following information:

    - facility information,
    - code reference (if known),
    - issue,
    - mitigation plan, and
    - attachments (e.g., drawings, photos, incident report, etc.).

- AHJ Evaluation. The AHJ shall evaluate the request to determine if it requires additional information, a determination memorandum, or an assessment.
- Risk Evaluation. The AHJ shall complete a risk evaluation when the request requires a determination memorandum.
- Memorandum Content. The AHJ shall as needed issue a determination memorandum that includes the following information:

    - facility information,

  - code references with edition year,
  - statement of problem,
  - mitigation methods,
  - risk evaluation,
  - expiration date, and
  - attachments (e.g., drawings, photos, supporting data, etc.).

- Distribution. The AHJ shall issue the determination memorandum to the requestor with a copy sent to the area manager, facility manager, project manager, regional safety manager, area safety manager, AHJT facilitator, and Reclamation Safety and Occupational Health Office.
- Record Findings in IAS. The area safety manager shall, as required, enter the determination memorandum findings identified at existing facilities that require a corrective action into IAS by updating existing LSC inspection findings or entering the findings as nonquestion-based discoveries within 30 calendar days after receiving the determination memorandum.
- Tracking Findings. The area safety manager shall track and update the determination memorandum findings identified at existing facilities in accordance with requirements of RSHS 1.23.

d. Cost

- Inspections. The area manager or facility manager shall provide funding for LSC inspections.
- Assessments. The regional director through the AHJ, area manager, facility manager, project manager, or regional safety manager shall establish the funding source and provide funding for LSC assessments.
- Determination Memorandums. The area manager, facility manager, project manager, or regional safety manager shall provide funding for determination memorandum work.
- Findings. The regional director through the AHJ, area manager, facility manager, project manager, or regional safety manager shall provide funding for LSC finding mitigations and improvements through extraordinary maintenance funding or other funding as appropriate.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Appendix 1.18A: Life Safety Code Questions

Question Number	Questions
1	Has the building usage, occupancy, or fire loading remained the same since the last inspection? Example: • new offices, increased or changed classification of storage commodities including chemicals, tours, public access, etc., • storage to office, office to assembly, visitor center to office, etc., • increased fire loading, and/or • unnecessary storage. Requirements: • NFPA 101, Chapters 4 and 6 • 29 CFR 1910 Subparts E and L • RSHS 1.9 • RSHS 1.18
2	Has the building construction remained the same since the last inspection? Example: • additions, remodels, new or removed walls, wall penetrations, new windows, etc., • interference/impact/impairment of fire detection and/or suppression systems, and/or • new vertical or horizontal openings in walls, floors, or ceilings (e.g., cable trays, conduits, pipe, vents, ducts). Requirements: • NFPA 101, Chapters 4, 8, 9, and 43 • 29 CFR 1910 Subpart L • RSHS 1.9 • RSHS 1.18
3	Are the means of egress readily visible/recognizable, clear, unobstructed, and illuminated? Required: • not hampered by security measures during occupancy, • exit discharge clear and free from snow and ice, rock fall, or other obstructions or trip and fall hazards, and/or

Question Number	Questions
	• stairwells and evacuation routes are free and clear of obstructions. Requirements: • NFPA 101, Chapter 7 • 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
4	Do means of egress doors function and swing in the proper direction? Required: • stairwell doors swing in direction of egress, • if occupancy greater than 50 people, exterior doors swing in direction of egress, • stairwell and hallway fire doors are kept in the closed position or equipped with automatic closure system connected to fire alarm, • doors open without excessive force, and/or • doors properly latch when closed. Requirements: • NFPA 101, Chapter 7 • 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
5	Are evacuation diagrams posted in assembly occupancies? Requirements: • NFPA 101, Chapters 7, 12, and 13 • 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
6	Do means of egresses appear compliant with requirements of 29 CFR 1910 Subpart E, Exit Routes and Emergency Planning, and National Fire Protection Association (NFPA) 101, Life Safety Code? • Yes, compliant. • No, further evaluation is required. Requirements: • NFPA 101, Chapter 7

Question Number	Questions
	• 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
7	Is emergency lighting provided and in good, operable condition per requirements of 29 CFR 1910 Subpart E, Exit Routes and Emergency Planning, and National Fire Protection Association (NFPA) 101, Life Safety Code? • Spot check operability. Requirements: • NFPA 101, Chapter 7 • 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
8	Are exit signs provided, clearly visible, and in good, operable condition per requirements of 29 CFR 1910 Subpart E, Exit Routes and Emergency Planning, and National Fire Protection Association (NFPA) 101, Life Safety Code? Required: • illuminated signs are functioning, and/or. • clear indication of exit direction. Requirements: • NFPA 101, Chapter 7 • 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
9	Are fire extinguishers provided, charged, and inspected monthly or are fire extinguishers not required? Required: • hanging at designated location, and/or • inspection tag attached and current. Requirements: • NFPA 101, Chapter 9 • 29 CFR 1910 Subpart L • RSHS 1.9

Question Number	Questions
	• RSHS 1.18
10	Are fire suppression systems inspected, tested, maintained and unobstructed? Required: • maintain 18 in. clear space below sprinkler for storage height 12 ft. or less, • maintain 3 ft. clear space below sprinkler for storage higher than 12 ft, • records of annual fire alarm and fire suppression systems inspection and testing available upon request, • sprinklers, tanks, piping, and supports appear in good condition, and • fire hose cabinets/standpipes in working order, visible, accessible, and tested/inspected annually? Note: removal of hoses must be documented with AHJ/local fire department. Requirements: • NFPA 101, Chapter 9 • 29 CFR 1910 Subpart L • RSHS 1.9 • RSHS 1.18
11	Does fire suppression appear compliant with requirements of 29 CFR 1910 Subpart E, Exit Routes and Emergency Planning, and National Fire Protection Association (NFPA) 101, Life Safety Code? • Yes, compliant. • No, further evaluation is required. Requirements: • NFPA 101, Chapter 9 • 29 CFR 1910 Subpart L • RSHS 1.9 • RSHS 1.18
12	Is the emergency action plan established and current? Required: • annual fire drills are conducted and documented, • emergency action plan training documented, and • emergency contact numbers conspicuously posted and made available to staff.

Question Number	Questions
	Requirements: • NFPA 101, Chapter 4 • 29 CFR 1910 Subpart E • RSHS 1.9 • RSHS 1.18
13	Is housekeeping and storage throughout the facility well maintained and orderly? Required: • excess trash and combustible materials removed in a timely manner, • Chemicals stored in proper cabinets, • oily rags disposed in approved containers, • flammable liquids stored in closed fire rated cabinets, • storage areas maintained in an orderly manner, • no storage in egress paths or under stairs, and • no storage near electrical panels, mechanical equipment, or heating equipment. Requirements: • NFPA 101, Chapter 4 • 29 CFR 1910 Subparts D and N • RSHS 1.9 • RSHS 1.18
14	Are the grounds surrounding the facility clear of combustible storage and dry vegetation? Required: • combustible storage is at least 20 ft away from facilities, • waste disposal dumpsters at least 20 ft away from facilities, • flammable gas tanks at least 25 ft away from facilities, and • dry vegetation around facilities is maintained at low height or removed. Requirements: • NFPA 101, Chapters 4 and 8 • 29 CFR 1910 Subparts E and L • RSHS 1.9 • RSHS 1.18
15	Is fire service access and equipment maintained and clear? Required:

Question Number	Questions
	• fire lane roads clear and accessible, and • fire hydrants, fire control valves, and Fire Department Connections (FDC) are visible, accessible, and operable. Requirements: • NFPA 101, Chapters 4 and 9 • 29 CFR 1910 Subparts E and L • RSHS 1.9 • RSHS 1.18
16	Is there a local fire department that will respond during a fire emergency? Required: • Name of responding department Requirements: • NFPA 101, Chapters 4 and 9 • 29 CFR 1910 Subparts E and L • RSHS 1.9 • RSHS 1.18

Section 1.19 Hazard Communication Program

1. Scope

The Hazard Communication Program (HCP) applies to all Reclamation operations where employees may be exposed to physical, health, and/or chemical hazards under normal working conditions or in foreseeable emergencies, as well as employees that purchase chemicals. This section is aligned with the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) incorporated into the Federal Register on March 26, 2012, and meets the requirements of the updated Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1200, Hazard Communication.

2. General Requirements

a. Laboratory Use of Chemicals

Reclamation laboratories required to have a chemical hygiene plan, as outlined in 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories, shall ensure their employees are trained on any additional elements in 1.19.4, Training Requirements, that are not covered in 29 CFR 1910.1450, except the location of the written HCP.

b. Disposal of Hazardous Chemicals

Hazardous waste disposal requirements for hazardous chemicals shall follow the federal, state, and local regulations where the site/facility is located.

3. Responsibilities

a. Reclamation Safety and Occupational Health Office

- Shall provide technical support to assist Regional Safety Managers and Program Coordinators (PC) with implementing the HCP.

b. Area Office Manager

- Shall designate an area office PC to implement the HCP.
- Shall provide the necessary resources to implement and maintain procedures within the HCP.

c. Area Office Program Coordinator

- Shall implement, administer, review, and update the HCP biennially or with any changed conditions in the workplace, such as new chemicals and/or hazards.
- Shall provide or coordinate HCP training covering the elements in 1.19.4, Training Requirements.
- Shall ensure chemical inventories are conducted biennially at the area office's sites.

- Shall ensure area office locations have a system in place to house Safety Data Sheets (SDSs) for their products used onsite (e.g., in binders, an online service provider).
- Shall coordinate with first-line supervisors to ensure all secondary containers are labeled appropriately as outlined in 1.19.7.b.(2), Secondary Container Labeling.
- Shall create a process to ensure all new hazardous chemicals have been reviewed and approved prior to purchase and have been added to the chemical inventory list.

d. First-Line Supervisors

- Shall perform/coordinate a workplace or work activities assessment to determine if hazardous chemicals are present or used which could result in potential exposure to their employees per RSHS Section 1.04, Work Safety Planning, and 1.04.2.a Hazard Assessments.
- Shall ensure employees are trained on the elements of the HCP, including which employees are responsible for various program elements.
- Shall ensure SDSs are readily available and are incorporated in the job hazard analysis (JHA) where hazardous chemicals will be used.
- Shall ensure employees are trained on the personal protective equipment (PPE) required for the job tasks and any additional PPE has been identified within JHAs.
- Shall coordinate walk throughs to ensure containers with the manufacturer's label are in English and legible and secondary containers are labeled properly as outlined in 1.19.7.b.(2), Secondary Container Labeling.
- Shall use the hierarchy of controls to review chemical hazards and compatibility information prior to purchasing new products and/or when it is necessary to review hazards and precautions as a result of an employee injury/illness from hazardous chemical use.
- Shall ensure employees know how to access the written HCP and SDSs and the process for obtaining new hazardous chemicals.

e. Employees

- Shall attend training and follow the requirements outlined in the HCP.
- Shall review the JHA and the SDS(s) prior to conducting the job task(s) which involve hazardous chemicals and follow the identified precautions.
- Shall obtain a secondary container label whenever they transfer hazardous chemicals from the manufacturer's original container to a secondary container.
- Shall follow the site/facility process for obtaining new hazardous chemicals.

f. Regional Safety Managers

- Shall assist in developing and establishing the HCP, when necessary, and shall perform periodic spot checks to ensure compliance with this section.

g. Project Managers/Contracting Officer Representatives

- Shall ensure contractors bringing in hazardous chemicals to a Reclamation worksite have the proper SDSs.
- Shall ensure contractors are aware of Reclamation's emergency response requirements for the worksite in the event of a spill or leak within a building or the environment.

h. Employees Purchasing Hazardous Chemicals

- Shall receive HCP training and follow the requirements outlined in this section.

4. Training Requirements

a. Initial Training

At a minimum, employees shall be trained on the following elements before initial job assignments and when new hazards are introduced into work areas:

- the requirements of this section,
- operations in the employees' work areas where hazardous chemicals are present,
- locations and availability of the written HCP including chemical inventories and SDSs,
- the sections and terminology used in SDSs,
- labels on shipping and secondary containers,
- methods and observations used to detect the presence of hazard chemicals (e.g., exposure monitoring, visual appearance/odor, hissing from piping),
- the physical and health hazards and hazards not otherwise classified of the chemicals used in the work areas,
- measures employees can take to protect themselves from hazards including specific procedures the site/facility has implemented to protect employees from exposure to hazardous chemicals such as appropriate work practices, emergency procedures, and PPE to use; and
- procedures for any non-routine tasks.

b. Refresher Training

Employees shall receive refresher training to review the SDSs when new products are introduced to the work area/operations and/or when it is necessary to review hazards and precautions as a result of employee injury/illness from hazardous chemical use.

c. Recordkeeping

All Reclamation training records shall be kept in the Department of the Interior official repository.

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment

Work areas and activities shall be assessed to determine if hazardous chemicals are present or used which could result in potential exposure to employees and to provide the appropriate controls to reduce employee exposure.

b. Safety Measures

The following minimum safety measures shall be observed when using hazardous chemicals:

- determine if the work can be done without the hazardous product or substituted for a less hazardous product,
- assess available engineering controls such as local ventilation or HEPA filtering vacuums,
- implement administrative controls that change the way work is done to reduce exposure,
- provide the required PPE from the JHA and SDSs for employees, ensure they know how to use it, and what the limitations are,
- read and understand all sections in the SDS, especially the exposure symptoms in section 11, Toxicological Information,
- ensure all secondary containers are labeled with the product's name and hazard warnings,
- store incompatible hazardous chemicals separately,
- refrigerators for food shall not contain hazardous chemicals,
- spills and leaks shall be cleaned up immediately if it is safe to do so, the employee has been trained on proper clean-up procedures, and the proper equipment for clean-up is available,
- follow the site/facility disposal procedures for hazardous chemicals; and
- ensure an emergency eyewash and shower are functional, provides at least 15 minutes of flow, and has a clear path of travel within 10 seconds (~55 ft.) on the same level where employees could come in contact with corrosive and toxic materials.

6. Pre-job Briefing and Planning Requirements

All JHAs where hazardous chemicals will be used shall incorporate the appropriate SDS(s) and be reviewed with the employees prior to performing the job task(s).

7. Safe Practices

a. Written Program

A written HCP shall be implemented when employees may be exposed to physical and/or chemical hazards under normal working conditions or in foreseeable emergencies. The written program shall include the following elements:

- container labeling requirements and SDS information,
- employee information and training,
- list of hazardous chemicals using the product identifier,
- methods to inform employees of the hazards of non-routine tasks; and
- hazards associated with chemicals contained in unlabeled pipes.

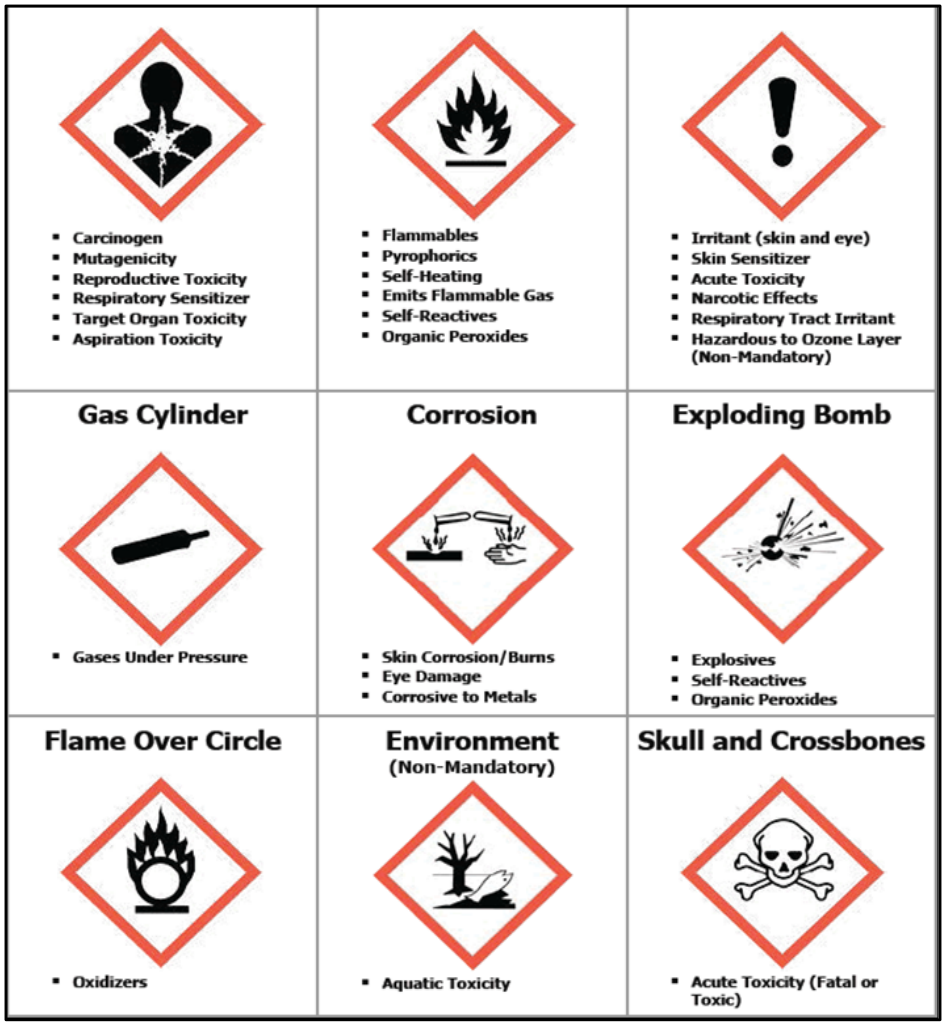
b. Labeling Requirements

- Labels on Shipped Containers. Chemical manufacturers must ensure each shipped container of hazardous chemicals is labeled in accordance with 29 CFR 1910.1200, Appendix C, Allocation of Label Elements (Mandatory). Hazards not otherwise classified, do not have to be listed on the container. Labels must be in English and prominently shown on the container with the following information:

    - product identifier, signal word, pictogram(s);
    - precautionary statement; and
    - name, address, and phone number of the chemical manufacturer or other responsible party.

- Secondary Container Labeling. Containers must either be labeled with information in 1.19.7.b.(1), Labels on Shipped Containers or with the product identifier and words, pictures, symbols, or a combination that provides information on the physical and health hazards. If an employee intends to immediately use a hazardous material after transferring it to a portable secondary container, the container does not need to be labeled.
- Alternative Labeling. When stationary process containers are used signs, placards, process sheets, batch tickets, or operating procedures may be used in lieu of affixing labels to the individual container.
- Pictograms. OSHA adopted the following 9 GHS pictograms in Figure 1.19-1. The Environment pictogram is not mandatory, per OSHA, but may be used on labels to provide information. These pictograms do not replace the diamond shaped labels the U.S. Department of Transportation requires for transporting chemicals.

FIGURE 1.19-1: GHS Pictograms and Descriptions



c. Safety Data Sheets

Each hazardous chemical used in the workplace shall have an SDS.

- SDS Requirements. Chemical manufacturers or importers must prepare the SDS in English and send it with the first initial shipment (copies in other languages are allowed). If an SDS is not included in the initial shipment, then one must be obtained as soon as possible. If it is authorized to purchase hazardous chemicals at local stores, then an SDS must be obtained from the store. If an SDS is not available, then it must be obtained from the manufacturer. SDSs must have the following sections and headings with accompanying information per 29 CFR 1910.1200 Appendix D, Safety Data Sheets (Mandatory):

    - Section 1 Identification,

- Section 2 Hazard(s) identification,
- Section 3 Composition/information on ingredients,
- Section 4 First-aid measures,
- Section 5 Fire-fighting measures,
- Section 6 Accidental release measures,
- Section 7 Handling and storage,
- Section 8 Exposure controls/personal protection,
- Section 9 Physical and chemical properties,
- Section 10 Stability and reactivity,
- Section 11 Toxicological information,
- Section 12 Ecological information,
- Section 13 Disposal considerations,
- Section 14 Transport information,
- Section 15 Regulatory information, and
- Section 16 Other information, including date of preparation or last revision.

- SDS Location. SDSs shall be readily accessible to employees during all work shifts. Electronic access, hard copies, or other alternatives may be used to ensure the employee has immediate access. When employees travel between workplaces and the SDSs are maintained at the primary workplace, the employee must be able to obtain the required SDS information in the event of an emergency.
- Trade Secrets. Chemical manufacturers may withhold specific information on the chemical identity and the exact percentage of the substance in a mixture on the SDS, if trade secret requirements are met. In the event of emergency first aid treatment, a physician or nurse can obtain the trade secret information without a confidentiality agreement. For non-emergency situations, trade secret information may be requested from the manufacturer following the steps outlined in 29 CFR 1910.1200(i)(3).

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.20 Safety and Occupational Health Program Evaluations

1. Scope

This section specifies the minimum requirements and procedures for conducting safety and occupational health (SOH) Program Evaluations (PEs). This section ensures alignment with the requirements established in Departmental Manual 485, Chapter 5, Program Evaluations and Federal Occupational Safety and Health Administration (OSHA) 29 CFR 1960.79, Self-evaluation of Occupational Safety and Health Programs.

2. General Requirements

Senior SOH professionals at the regional and Bureau level will conduct SOH PEs. SOH PEs will be conducted in a collaborative manner between the local SOH professional and local management officials. SOH PEs affirm the presence of effective SOH programs. SOH PEs are programmatic reviews and are not intended as compliance inspections or facility inspections. SOH PEs comprise one part of overarching SOH programmatic internal control requirements and examine program integration, culture, and effectiveness.

3. Responsibilities

a. Chief, Reclamation Safety and Occupational Health Program

- Shall develop and administer the SOH PE program.
- Shall conduct SOH PEs on each regional SOH program once every 3 years.

b. Reclamation Safety Council

- Shall review the SOH PE program annually to ensure it meets the needs of the organization while adhering to governing Departmental requirements and Federal OSHA Standards.

c. Regional Safety Managers

- Shall implement the SOH PE program in the region.
- Shall conduct SOH PEs for each area and field office at least once every 3 years.

d. Regional/Area Office Program Coordinators, Safety Professionals, and Collateral Duty Safety Representatives

- Shall actively participate in, and support, the SOH PE program.

4. SOH Program Evaluation Process

a. Pre-Coordination and Communication

- Schedule. The SOH official conducting the PE shall verify the start date of the PE 3 months in advance.

- Safety Evaluation (SAFE) Questions Selection. The regional or area SOH office being evaluated shall work collaboratively with their local managers to select questions from the SAFE checklist they feel would provide the most value to their local unit during the PE. The SAFE checklist questions selected by the regional/area offices fulfill the Departmental requirements for conducting SOH PEs.
- SAFE Question Agreement. The SOH official conducting the PE and the regional or area SOH office being evaluated shall agree upon the SAFE checklist questions to be assessed during the PE 2 months prior to the scheduled evaluation date.
- SAFE Tool. The SOH official conducting the PE shall update the SAFE Tool for use during the SOH PE with the questions that have been selected.
- SAFE Completion. The regional or area SOH office being evaluated shall complete the SAFE Tool and provide the completed SAFE Tool to the SOH official conducting the PE at least 2 weeks prior to the start of the PE.
- Documentation Submittal. The regional or area SOH office being evaluated shall provide to the SOH official conducting the PE documentation verifying the status of the SOH program at least 2 weeks prior to the start of the PE.

b. Conducting the SOH Program Evaluation

- In-Person. The SOH official shall conduct SOH PEs in person.
- In-Brief. The SOH official conducting the PE shall conduct an informal in-brief with local senior officials, SOH professionals, and whomever else local senior officials feel should be invited, such as supervisors, managers, and labor representatives.
- Process Overview. During the in-brief, the SOH official conducting the PE shall discuss the intent of the PE and the process used to conduct the PE.
- Site Visits. The SOH official conducting the PE shall visit sites or offices appropriate to validate the current status of those program areas that will be evaluated based upon the criteria selected from the SAFE Tool.
- Close-out Briefing. At the conclusion of the PE, the SOH official conducting the PE shall conduct a close-out briefing with the local senior officials, SOH professionals, and whomever else the local senior official feels should be invited, such as supervisors, managers, and labor representatives.

c. Program Evaluation Report

- Written Report. The written report shall include the following:

    - An introductory paragraph indicating who conducted the PE, the dates the PE was conducted, and the regional or area SOH office evaluated.
    - A paragraph that outlines current SOH strengths identified during the PE that should be continued.

  - A paragraph that outlines opportunities for improvement that, if acted upon by local leadership, would benefit the local SOH program and mitigate risk exposure to employees.

- SAFE Tool. The SOH official shall attach a copy of the SAFE Tool report, including the selected questions, responses, and dashboard, to the written report.
- Draft Review. The SOH official shall share a draft of the PE report with the senior official and SOH office that was evaluated for review to ensure there is concurrence and understanding regarding the content of the report. The draft report will include findings and recommendations. The evaluated unit will provide a written response to each recommendation notating concurrence, partial concurrence, or no concurrence.
- Final Report. The SOH official will address the final SOH PE report to the regional director, area office manager, or field office manager relative to the level of review.
- Report Sharing. The local senior official of the unit evaluated shall consider sharing the final PE report with local employees and with their senior rating official. For example, area managers may share a copy of the report with the regional director. Regional directors may share a copy with the Deputy Commissioner for Operations.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 1.21 Motor Vehicle Safety

1. Scope

This section sets forth requirements for safe motor vehicle operation, required training, and safe practices. It applies to all Bureau of Reclamation (Reclamation) employees who operate the following types of vehicles for official government business:

- government-owned vehicles (GOV)
- General Services Administration (GSA)-leased vehicles
- GSA short-term rental vehicles
- rental vehicles, and
- privately-owned vehicles (POV).

2. General Requirements

Operation of motor vehicles on official government business must comply with this section, as well as state and local requirements. Security, law enforcement, and emergency responders shall operate vehicles as directed by Department Manual (DM) Series 21, Part 446 Law Enforcement. Operators of GSA-leased vehicles shall comply with both this section and GSA requirements. All Reclamation employees who operate or are passengers in a GOV, GSA-leased, rental, or POV on official government business shall wear vehicle installed seatbelts whenever the vehicle is in motion. When using motor vehicles to transport hazardous materials greater than the Department of Transportation (DOT) thresholds, the vehicle must be placarded as required by DOT. A rental vehicle, paid for by the government, shall be treated as a GOV.

3. Responsibilities

a. Regional Safety Managers

- Shall verify if the region will participate in employer driving record programs with the Department of Motor Vehicles (DMV) or require obtaining an Appendix 1.21-A: Annual Motor Vehicle Operator's Certification from each operator.

b. Local Fleet Managers or Custodial Property Officers

- Shall correct any vehicle deficiencies which affect safe vehicle operation before the vehicle is returned to service.
- Shall ensure that applicable vehicles are equipped with portable fire extinguishers and/or first aid kits per paragraph 1.21.7 of this section.
- Shall ensure all GOV and GSA leased vehicles have a Motor Vehicle Accident Reporting Kit per paragraph 1.21.7.c of this section.

- Shall follow all GSA and Department of the Interior (Department) guidance for routinely scheduled maintenance for fleet vehicles in their area of responsibility.
- Shall perform safety and preventative maintenance inspections at regularly scheduled intervals as required by GSA and/or the manufacturer.

c. Area Office Safety Professionals

- Shall review requests for defensive driver training differing from those offered by the National Safety Council.
- Shall periodically review employee safety training records to ensure those employees operating motor vehicles to conduct official business have received training in accordance with paragraph 1.21.4.
- Shall work collaboratively with their local fleet managers to identify and resolve safety discrepancies or concerns with locally assigned GOVs.

d. First-Line Supervisors

- Shall ensure all motor vehicle operators under their supervision are aware of, and comply with, the requirements of this section.
- Shall monitor employee vehicle operation limitations (suspension, restriction, revocation, or cancellation of an employee's license) while on duty.
- Shall ensure employees who drive for official government business complete all defensive driving training requirements identified in this section.
- Shall ensure Reclamation employees operating vehicles requiring a Commercial Driver's License (CDL):

    - schedule and attend a Reclamation funded DOT medical examination,
    - schedule and attend a Reclamation funded DOT license examination, and
    - provide the medical clearance and license examination results to the Office of Human Resources for inclusion in the electronic official personnel file.

- Shall complete and maintain training logs along with applicable agreement documents for contract operators.
- At least annually, shall verify that motor vehicle operators are licensed, by either:

    - working with the DMV to obtain driving records, or
    - obtaining an Appendix 1.21-A: Annual Motor Vehicle Operator's Certification from each operator.

- Shall ensure employees transferring from another state obtain a driver's license within the timeframe mandated by state law if the employee will be operating motor vehicles for official government business.

- Shall ensure the position description lists motor and/or commercial vehicle operation as part of an employee's official job duties if the employee will be operating motor vehicles for official government business.
- Shall notify the local fleet manager of any vehicle damage or motor vehicle accidents identified or reported by employees.
- Shall enter all motor vehicle incidents in the Safety Management Information System.

e. Operators

- Shall obtain and maintain a valid state-issued driver's license.
- Shall participate in an employer driving record program with the DMV or complete the Appendix 1.21-A: Annual Motor Vehicle Operator's Certification, as required by the first-line supervisor.
- Shall promptly notify the first-line supervisor if there is a suspension, restriction, revocation, cancellation, or other disqualification on their driver's license.
- Shall adhere to the Department's Temporary Duty Travel Policy while operating a motor vehicle during official government travel.
- Shall report vehicle malfunctions, failures, damage, vehicle collisions, and property damage to their first-line supervisor, local fleet manager, and the custodial property officer.
- Shall pay with personal funds any fines received from moving and/or parking violations.
- Shall not use any tobacco products while operating a GOV, GSA-leased, or rental vehicle.
- Shall verify the Motor Vehicle Accident Report Kit is present and complete in GOV and GSA-leased motor vehicles prior to operation.

f. CDL Operators

- Shall have a valid CDL or commercial license permit (CLP) when operating types of vehicles specified in 1.21.4.b.

g. Training Officers/Coordinators

- Shall provide access to defensive driving courses.
- Shall provide accurate training reports to first-line supervisors and safety professionals upon request.

4. Training Requirements

a. Initial

- Defensive Driver Training. Reclamation employees who operate motor vehicles in the performance of their duties shall complete defensive driver training prior to operating motor vehicles while on duty. This includes individuals who operate POVs for official government business such as driving to and from the airport for temporary duty or work-

related errands. Employees shall obtain defensive driver training through any nationally recognized defensive driver course, such as that provided by the National Safety Council, or a locally developed course meeting the requirements listed herein. Training shall include familiarization with the Motor Vehicle Accident Report Kit (see paragraph 1.21.7.c.)

- Content Requirements. Locally developed defensive driver training and refresher courses may be provided online, in a classroom setting, hands-on setting, field driving course, or any combination and must incorporate the following:

  - definition and benefits of defensive driving principles,
  - identification of risky driving attitudes and behaviors,
  - familiarization with the NSC's Defensive Drivers Collision Prevention Formula,
  - benefits of occupant restraint systems,
  - effects of alcohol and other drugs on driving ability,
  - distracted driving information related to cell phone usage,
  - physical and mental driver conditions affecting driving ability,
  - techniques to maintain control during adverse driving situations,
  - techniques to avoid and/or reduce collisions, and
  - skills associated with safe turning, passing, and backing maneuvers.

b. Certification

A CDL or CLP is required to operate any of the following vehicles:

- any combination of vehicles with a gross combined weight of 26,001 or more pounds, providing the gross vehicle weight rating (GVWR) of the vehicle being towed is more than 10,000 pounds,
- any single vehicle with a GVWR of 26,001 or more pounds, or any such vehicle towing another not more than 10,000 pounds,
- any vehicle, regardless of size, deigned to transport 16 or more persons, including the driver, or
- any vehicle required by Federal regulations to be placarded while transporting hazardous materials.

The operator shall obtain the CDL through their home state licensing bureau (e.g., DMV). License expiration and endorsement requirements vary state by state. All operators shall follow state and local laws regarding CDLs.

c. Refresher

Reclamation employees and volunteers who operate motor vehicles on official government business shall complete defensive driving refresher training once every five years from the initial training completion date.

d. Recordkeeping

The Department shall keep all Reclamation training records in the official Departmental repository. Acquisition/agreement documents shall track defensive driving training for volunteers and contractors operating vehicles for official government business.

5. Hazard Identification, Assessment, and Safety Measures

a. Substance Abuse Testing for CDL Operators

Reclamation employees whose position description require a CDL shall be enrolled in the Department's Drug Testing Program administered by the servicing human resources office.

b. Substance Abuse Testing for All Operators

Reclamation employees in testing designation positions, as identified in their position description, are subject to selection for random testing as stated in the Department's Personnel Bulletin No. 17-15, Drug-Free and Alcohol-Free Workplace Plan. Employees may be subject to testing when their actions are reasonably suspected of having caused or contributed to an accident which meets the following criteria: (1) the accident results in a death or personal injury requiring immediate hospitalization, and/or (2) the accident results in damage to government or private property estimated to be in excess of 10,000 dollars.

6. Hazardous Environmental Conditions (Weather/Other)

Operators shall check weather conditions and ensure vehicles are fit for anticipated driving conditions prior to vehicle operation and respond accordingly. Weather conditions may dictate a delay in vehicle operation, alteration of the route driven, selection of a different vehicle, or cancelation of the trip.

7. Safety Equipment

a. Fire Extinguishers

Portable fire extinguishers, minimum five pound 3-A:40-B:C rated, shall be provided in:

- GOV and GSA-leased vehicles used as a transportation van/bus,
- any vehicle over 26,001 GVWR, and
- service/special purpose/material hauling vehicles.

The custodial property officer or designated employee shall maintain and perform monthly inspections on all portable fire extinguishers in accordance with RSHS Section 1.09, Fire

Prevention and Protection. These employees shall also secure fire extinguishers so they are accessible in an emergency and prevent them from becoming a projectile in the event of an accident. Light duty passenger vehicles, pickup trucks, and SUVs do not require portable fire extinguishers.

b. First Aid Kits

Medium and heavy-duty GOV and GSA-leased vehicles, and any GOV and GSA-leased field-going vehicles (traveling to rugged and/or isolated areas) shall be equipped with a first aid kit meeting the requirements of the American National Standards Institute (ANSI) Z308.1 and Section 1.05, Medical Services and First Aid. The assigned vehicle operator or pooled vehicle supervisor will maintain and perform monthly inspections on all first aid kits in accordance with ANSI Z308.1.

c. Motor Vehicle Accident Reporting Kit

All GOV and GSA-leased vehicles shall have a Motor Vehicle Accident Reporting Kit in the glove compartment of the vehicle. This kit includes a SF-91 Motor Vehicle Accident Report (one copy) and SF-94 Statement of Witness (two copies).

8. Safe Practices

a. Preventing Backing Accidents

Employees will conduct a walk-around of the rear of the vehicle prior to backing or will utilize a spotter when one is available and when the operator's rearview vision is obscured.

b. Prohibited Activities

Operators must follow state and local laws and will not drive while distracted in addition to the following activities:

- driving while under the influence of alcohol, illegal drugs, prescription drugs, and over-the-counter drugs that warn against "operating heavy machinery,"
- driving with a suspended or invalid driver's license,
- transporting non-authorized persons or pets,
- using tobacco products, including vaping and smokeless tobacco, and/or
- conducting personal business unless authorized by management.

c. Cell Phone Use

Operators may use cell phones in hands-free mode while driving. Operators shall not text, instant message, email, program a global positioning system (GPS), or use any other electric device while driving.

d. Traveling to Rugged and/or Isolated Locations

When traveling to dangerous and/or isolated locations operators shall ensure there is at least one means of communication in the vehicle (e.g., cell phone, satellite phone).

e. Mechanical Problems

If mechanical problems occur while operating a GOV or GSA-leased vehicle, as soon as safely possible, the operator shall:

- move the vehicle to the road shoulder using turn signals,
- park the vehicle off the roadway,
- turn on the vehicle hazard lights, and
- contact the local fleet manager responsible for the GOV. If the vehicle is GSA- leased vehicle (license plate starts with the letter "G"), the operator shall call the phone number on the back of the fleet card. If the vehicle is a Department-owned vehicle (license plate begins with the letter "I"), the operator shall follow the procedure provided by the local fleet manager.

If mechanical problems occur while operating a rented vehicle, as soon as safely possible, the operator shall:

- move the vehicle to the road shoulder using turn signals,
- park the vehicle off the roadway,
- turn on the vehicle hazard lights,
- contact the rental car agency, and
- notify the operator's supervisor and local fleet manager.

f. Vehicle Collisions

When involved in a vehicle collision with property damage or an injury (employee or member of the public), the operator shall:

- immediately contact 9-1-1 in the case of an injury,
- always file a police report even if there is no property damage,
- document with pictures,
- contact the operator's supervisor and local fleet manager,
- complete the Motor Vehicle Accident Reporting Kit and submit to the first-line supervisor,
- not share personal insurance, as the Motor Vehicle Reporting Kit has proof of insurance information, and
- report the incident in the Safety Management Information System.

g. Inspections

- Walk-Around Inspections. Operators shall conduct a walk-around inspection prior to every use.

- Safety and Preventative Maintenance Inspections. Fleet managers and operators of GSA-leased vehicles must comply with the safety and preventative maintenance schedules, instructions, and notifications issued by GSA for the vehicles. All Department-owned vehicles shall meet mandatory state emission and/or mechanical inspection requirements.
- Deficiencies. Operators shall report deficiencies identified upon walk-around inspections to the fleet manager and custodial property officer or the rental company if it is a government-rented vehicle. Vehicle deficiencies which affect safe operation shall be repaired or corrected by approved vendors before the vehicle is returned to service.

h. Hours of Service

Employees shall not operate motor vehicles for a continuous period of more than 10 hours in any 24-hour period. Moreover, no employee may operate a motor vehicle while on duty after being in a duty status for more than 12 hours during any 24-hour period. A minimum of eight consecutive hours shall be provided for rest in each 24-hour period. See RSHS 1.04.8.d, Fatigue Management.

i. Headlights

Employees shall always operate the vehicle with the headlights on, even in daylight.

j. Parking

The operator shall reverse/back-in to a parking space when reasonable and safe to do so.

k. Loads

Operators shall secure cargo loads, on or inside a vehicle, with adequate strength tiedowns, dunnage or dunnage bags, shoring bars, or a combination of these methods.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 1.21-A: Motor Vehicle Operator Certification

Appendix 1.21-A (Form 7-2632: Annual Motor Vehicle Operator's Certification) is available to print at: https://teamssp.bor.doi.net/printanddup/forms/7Forms/7-2632.pdf.

Section 1.22 Accident Investigation and Reporting

1. Scope

This section establishes requirements for accident investigation and reporting processes for all Bureau of Reclamation (Reclamation) facilities and worksites. This section does not establish requirements for accident investigation of events involving aircraft, boats, or vessels. The Department of the Interior (Department) investigates these events (see Departmental Manual, Series 27, Safety Management, Part 485, Safety and Occupational Health Program, Chapters 15, 16, 22). Section 3.4.4 of Reclamation's National Aviation Management Plan specifically addresses investigation requirements for aviation mishaps.[1]

2. General Requirements

Reclamation's goal is to learn from accidents and incidents (i.e., near misses) to help prevent future occurrences. By standardizing accident investigation and reporting processes, Reclamation can improve the quality and distribution of information collected.

3. Responsibilities

a. Designated Agency Safety and Health Official (DASHO)

- Shall authorize and appoint a Serious Accident Investigation Team (SAIT) for any serious accidents, as defined in 485 DM 7 and outlined in paragraph 1.22.8.e, Reporting to Occupational Safety and Health Administration (OSHA).
- Shall determine whether the consequences of an incident warrant a Serious Accident Investigation (SAI).

b. Reclamation Chief, Safety and Occupational Health

- Shall notify the DASHO of serious accidents.
- Shall ensure qualified personnel are available to establish a SAIT.
- Shall ensure serious accident abstracts and reports are prepared for distribution.
- Shall provide feedback to and coordinate with the Department's Office of Occupational Safety and Health to ensure the Safety Management Information System (SMIS) meets Reclamation's accident data needs.
- Shall provide senior and executive management information on accidents and incidents occurring throughout Reclamation.
- Shall verify the submission of required documentation for accidents or incidents per this section.

[1] https://www.usbr.gov/recman/sle/NAMP.pdf

c. Regional Safety Managers

- Shall notify the regional director and the Reclamation Chief, Safety and Occupational Health Office, of any serious accident.
- Shall notify the regional director and the Reclamation Chief, Safety and Occupational Health Office, of any injury or illness resulting in inpatient hospitalization, amputation, or loss of an eye.
- Shall review all regional injuries and identify accident and incident trends.
- Shall verify maintenance of accident and incident records/logs.
- Shall provide technical support, as needed, to ensure all contractors working at Reclamation-owned facilities submit necessary documentation for accidents or incidents in the required time frame.
- Shall ensure regional safety professionals can access the elevated permission levels in SMIS.
- Shall ensure the completion of an Augmented Accident Investigation (AAI) for incidents with a high potential for a serious accident.
- Shall send a copy of the final AAI report and abstract to the Director, Mission Assurance and Protection Organization, and the Reclamation Chief, Safety and Occupational Health Office.

d. Area Office Managers

- Shall provide resources and technical support to complete local accident investigations (separate from AAI and SAI, which the regional and agency-level office complete, respectively).
- Shall review OSHA Form 300, Log of Work-Related Injuries and Illnesses.
- Shall review and sign OSHA Form 300A, Summary of Work-Related Injuries and Illnesses.
- Shall post OSHA Form 300A by February 1, and until April 30, of each year. This form summarizes injuries from the previous year and must be posted in a conspicuous place where notices to employees are customarily posted.

e. Area Safety and Occupational Health Professionals

- Shall update and maintain the OSHA Form 300.

f. First-Line Supervisors

- Shall immediately notify the regional safety manager and local safety professionals of any serious accidents and/or injury or illness resulting in an inpatient hospitalization, amputation, or loss of an eye.
- Shall conduct and document an investigation as required in this section.
- Shall notify the local safety professional, as soon as possible, after every work-related accident or incident.

- Shall report in the SMIS and provide all required information as soon as possible, but no more than six working days after learning of the accident or incident.
- Shall ensure employees receive medical treatment for occupational illness or injury.
- Shall conduct incident investigations and identify root causes prior to completing the entry in the SMIS.
- Shall follow the Office of Workers' Compensation Programs (OWCP) procedures in accordance with Reclamation Manual, Directives and Standards, HRM 02-02, Workers' Compensation (WC) Program.
- Shall share lessons learned with employees.

g. Employees

- Shall notify the supervisor or respective safety professional as soon as possible, but no more than four hours after any work-related serious accident and any work-related injury or illness resulting in an inpatient hospitalization, amputation, or loss of an eye.
- Shall notify the supervisor of every work-related accident or incident as soon as possible.
- May file compensation claims and/or property damage forms in accordance with HRM 02-02.

4. Training Requirements

a. Initial

Team leaders, chief investigators, and safety professionals on SAI or AAI teams must attend and graduate the Interagency Serious Accident Investigation Course. It is not a requirement for other team members to complete this course. Team leaders shall determine required training for team members.

b. Recordkeeping

Reclamation shall keep all training records in the Department of the Interior's official repository and manage them in accordance with the Information Management Handbook.

5. Hazard Identification, Assessment, and Safety Measures

Prior to beginning an investigation, accident investigation team leaders, in coordination with safety professionals on the investigation teams, must identify potential hazards arising from investigation activities and include hazard controls in the Job Hazard Analysis (JHA) to implement during the performance of the investigation. The JHA must identify hazard controls according to the hierarchy of controls, which prioritizes in order from most effective to least effective. The hierarchy of controls are as follows:

- elimination,
- substitution,

- engineering controls,
- administrative controls, and
- personal protective equipment.

6. Hazardous Environmental Conditions (Weather/Other)

Accident investigation JHAs must account for the potential effects of inclement weather on investigation procedures (e.g., visiting outdoor accident sites). JHAs must also consider the hierarchy of controls and utilize the "elimination" control by delaying the accident investigation until weather conditions permit a safe investigation. If an investigation is performed with exposure to inclement weather (e.g., colder temperatures) include personal protective equipment (PPE) and procedures to address weather hazards.

7. Personal Protective Equipment

The investigation team leader, in coordination with the safety professional, shall review the JHA and determine PPE needed for all team members according to job-specific requirements. The team lead and safety professional shall provide and train investigation team members on the reason for PPE, and proper use, fit, and limitations of PPE and other required safety equipment in the JHA. See paragraph 1.22.6, Hazardous Environmental Conditions (Weather/Other), and Section 1.07, Personal Protective Equipment.

8. Safe Practices

a. Accident Reporting

As required by 485 DM 7, employees shall report every work-related accident and incident to their immediate supervisor and electronically file in the SMIS. Immediately after an accident, the supervisor shall notify the local safety professional. The supervisor will review and record job-related SMIS accident/incident reports, including first-aid cases, into SMIS within six working days following the date management was notified of the occurrence. File OWCP claims within 10 working days, or as required by OWCP regulations, after reporting in the SMIS. The area/local safety professional will maintain the OSHA’s Form 300.

b. Accident Investigations

The first-line supervisor shall investigate every work-related accident or incident, conduct accident investigations to determine root causes and prevention methods to avoid future occurrences, and determine the personnel involved in investigations according to the severity of the accident. First-line supervisors will not use these investigations for disciplinary actions. If a Board of Survey requests information from an accident investigation, the first-line supervisor will only share factual information.

c. Augmented Accident Investigations

An AAI is carried out at the regional, area, or local level at the discretion of the regional safety manager on behalf of the regional director. AAI reports and materials shall be more detailed than an accident investigation and should follow a similar format to SAI reports. AAI reports shall include findings, causes, and recommendations, and shall be entered in the SMIS. The regional safety manager shall provide completed AAI reports to the Reclamation Safety and Occupational Health Office for distribution and prevention purposes within 45 calendar days after the accident. The regional safety manager will send a copy of the final report to the Director, Mission Assurance and Protection Organization, and the Reclamation Chief, Safety and Occupational Health Office.

d. Serious Accident Investigation

An SAI is required when an employee action or condition results in:

- any employee fatalities that result from injuries or illness sustained during the performance of work duties,
- one or more non-employee fatality,
- the inpatient hospitalization of three or more persons,
- property damage (including site mitigation or cleanup) of 500,000 dollars or more, and/or
- consequences the DASHO determines warrant further investigation (e.g., one or two employees hospitalized due to severity of work-related injuries or illnesses, or a near miss incident).

The regional safety manager shall immediately report serious accidents to Reclamation's chief of safety and occupational health and OSHA per paragraph 1.22.8.e. The DASHO will authorize and appoint an SAI team, who will conduct the SAI per the requirements in 485 DM 7. SAI reports shall include findings, causes, and recommendations, and shall be entered in the SMIS. The SAI team lead must provide completed SAI reports to the Reclamation Safety and Occupational Health Office for distribution and prevention purposes within 45 calendar days after the accident. The SAI team lead will send a copy of the final report to the Director, Mission Assurance and Protection Organization.

e. Reporting to OSHA

In addition to Reclamation's accident reporting requirements, OSHA requires reports for:

- work-related fatalities within eight hours, and
- work-related inpatient hospitalizations, amputations, and losses of an eye within 24 hours.

Report accidents to OSHA in any of the following ways:

- call OSHA's free and confidential number at 1-800-321-OSHA (6742),

- call the closest OSHA area office during normal business hours, and/or
- use OSHA's online form: https://www.osha.gov/report.html.

f. Public Injuries on Reclamation-Owned Land

When a member of the public is injured or dies on Reclamation-owned land, the field, area, or power office managers must complete a spot report and submit to the regional duty officer per Reclamation Manual Directives and Standards, SLE 08-03, Serious Incident Reporting and Duty Officer Program.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.23 Safety Inspection and Abatement

1. Scope

This section specifies the minimum requirements for conducting safety and occupational health inspections of Reclamation facilities that are designated duty stations, construction sites, and other worksites. The following serves to standardize safety inspections, abatement tracking processes, and compliance with Department of the Interior (Department) and Occupational Safety and Health Administration (OSHA) requirements. This section applies to all Reclamation employees who conduct or participate in safety inspections and abatement of inspections findings.

2. General Requirements

Trained staff will conduct inspections with the relevant knowledge and experience to identify hazards within specific worksites and operations. After identification, staff must assess, prioritize, document and then abate worksite hazards. The Inspection and Abatement System (IAS) shall be the official inspection and abatement tracking system. Staff will prioritize deficiencies through Risk Assessment Codes (RAC), which consider the severity and probability of a hazardous condition resulting in an accident (see 1.23.6.e, Risk Assessment Codes for descriptions). The IAS is a safety inspection tool available through the Safety Management Information System (SMIS) which provides Reclamation facilities a place to record safety inspection findings and track progress in abating them.

3. Responsibilities

a. Reclamation Safety and Occupational Health Office (SOHO)

- Shall administer IAS, which includes reviewing and updating to reflect any changes to safety requirements.
- Shall support IAS users through training, set up, and technical assistance.
- Shall review facility inspections and findings in IAS to provide the Reclamation Leadership Team with an annual summary of Reclamation inspection findings and abatement.

b. Regional Safety Managers

- Shall ensure an effective process is in place for identification, evaluation, and control of occupational safety and health hazards.
- Shall verify inspection of Reclamation facilities, which are designated duty stations for Reclamation employees within the geographic area of responsibility, at least once annually and implementation of a corrective action plan for each finding.

- Shall be aware of facilities inspected less than once annually, maintaining a record of written justification from area office safety professionals.
- Shall support area offices and first-line supervisors at facilities by coordinating/providing safety awareness and hazard recognition training.
- Shall assist in immediate abatement action for RAC-1 and RAC-2 findings.
- Shall review patterns of frequently occurring injuries and illnesses.

c. Area Office Safety Professionals

- Shall schedule and conduct, or ensure a qualified inspector conducts, the annual safety inspections at all facilities, which are designated duty stations for Reclamation employees, within the area of responsibility.
- Shall provide alternative safety inspection schedules and justifications to their Regional Safety Manager for facilities not inspected on an annual basis.
- Shall report and track findings in IAS until corrective action is taken either to eliminate the hazard or reduce the hazard to an acceptable level.
- Shall support field offices in documenting field office facility inspections, findings, and abatement in IAS, as well as coordination with collateral duty safety representatives (CDSR), safety committees, supervisors, and managers.
- Shall ensure IAS is updated quarterly until hazards are eliminated or reduced to an acceptable level.
- Shall review all open inspection findings in IAS on a quarterly basis.
- Shall support first-line supervisors and field staff in coordinating/providing training which incorporates the awareness of safety and health hazards.
- Shall inform and request assistance from the Regional Safety Manager, and if necessary, the next higher management level, if abatement of a hazardous condition is not within the authority and resources of Reclamation (see 1.23.6.3.d, Resources).

d. First-Line Supervisors

- Shall monitor conditions at worksites to prevent injuries, occupational illnesses, and property damage accidents. This includes performing periodic visits, at least annually, to employee worksites to ensure employee work practices are in alignment with governing safety and health standards.
- Shall coordinate with the local area office safety professionals to train employees and designated CDSR personnel to recognize hazardous and unhealthful work practices, conditions, and how to report and correct them.
- Shall ensure rapid abatement of unsafe or unhealthful work practices and conditions.

e. Collateral Duty Safety Representatives and Safety Committee Members

- Shall coordinate with the area office safety professionals to facilitate/conduct facility inspections and attend training for hazard recognition and related safety standards.

- Shall assist with inspection follow up, including IAS tracking and coordination for abatement of findings.
- Shall coordinate with area office safety professionals to ensure local field staff receive necessary training to recognize and manage safety and health hazards and maintain compliance with applicable safety requirements.
- Shall coordinate with area office safety professionals to notify the regional safety manager when a RAC-1 or RAC-2 finding is identified.

f. Inspectors

- Shall have necessary training to understand the hazards associated with the worksites they are inspecting and ensure the involvement of subject matter experts when the inspection is outside or beyond their training.
- Shall notify the facility safety representative and first-line supervisor immediately when a RAC-1 finding is identified.
- Shall notify the facility ahead of time of intent to inspect and attend an opening meeting.
- Shall verbally, or in writing, disclose anticipated findings of the inspection to the facility manager prior to leaving the facility.
- Shall maintain access to IAS through SMIS and input annual inspections/findings, as well as any RAC-1 and RAC-2 findings throughout the year, in IAS.

4. Training Requirements

a. Initial

All persons conducting worksite inspections shall be trained to recognize the hazards associated with the area they are inspecting to identify and evaluate hazards of the working environment and suggest general abatement procedures.

b. Proficiency Qualifications

Area safety professionals, or an inspector qualified by the facility manager and the area safety professional, will conduct annual safety inspections in compliance with 29 CFR 1960.25, Qualifications of safety and health inspectors and agency inspections.

c. Recordkeeping

The Department shall keep all Reclamation training records in the official Departmental repository.

5. Personal Protective Equipment (PPE)

Inspectors are required to comply with safety rules and practices of the facility when conducting inspections, including using the required PPE. PPE may include, but is not limited to hardhats, safety glasses, safety-toe shoes, and hearing protection. Refer to RSHS Section 1.07, Personal Protective Equipment, for additional information.

6. Safe Practices

a. Inspections

Reclamation will conduct and document inspections of all establishments under its control for safety and health compliance as required by 29 CFR 1960.26, Conduct of Inspections, DM 485 Chapter 6, and this section. Reclamation will conduct more frequent inspections when there are increased safety risks.

- Frequent Worksite Inspections. Supervisors, or the designee, shall inspect conditions daily to prevent injuries, occupational illnesses, and property damage. These inspections may be conducted informally and do not require input into IAS for tracking, unless a RAC-1 or RAC-2 is identified.
- Annual Inspections. Persons meeting the requirements of paragraph 1.23.4.b must inspect Reclamation facilities serving as designated duty stations for Reclamation employees, at least annually. Area office safety professionals and inspectors will document this activity as required in paragraph 1.23.6.c of this section.
- Inspector Right to Entry. OSHA, the Department, and Reclamation safety professionals will have the right to enter any facility, construction site, or other worksite to perform an inspection. They have the right to inspect any item or place within the establishment and to talk with any employee, manager, supervisor, visitor, volunteer, contractor, or concessionaire associated with the facility.
- Annual Inspection Procedure:

    - Notification. The inspector shall notify the facility ahead of time of intent to inspect and attend an opening meeting to discuss plans and obtain relevant records.
    - Participation. The inspector shall provide an opportunity for participation by a representative of the worksite/facility and an employee representative, including participation in the opening and closing meetings. All participants shall comply with facility safety rules and practices when conducting inspections. All participants shall avoid unreasonable disruption of the facility operations. The inspector may deny the right of accompaniment to any person whose participation interferes with the inspection.
    - Hazard Assessment. A hazard assessment must be completed by the inspector and facility staff to identify all hazards specific to the work or tasks to be performed. Refer to RSHS Section 1.04, Work Planning. Analysis must include electrical shock and arc flash hazard considerations. See Facilities Instructions, Standards and Techniques Volume 5-14 for more information concerning arc flash hazards. A hazard assessment will determine if a job hazard analysis (JHA) must be developed and the identification of any hazardous energy control procedures necessary to ensure the safety of personnel and facilities. The inspector shall address all hazards identified by a hazard assessment and mitigation techniques identified on the JHA.

- Imminent Danger Conditions. The inspector shall immediately inform management and employees of imminent danger conditions.
- Other Resources. The inspector shall consult with employees on matters of safety and health, examine accident records, and previous inspection reports. The inspector, or designee, shall take photographs for documentation where appropriate.
- Risk Assessment. The inspector shall assign a RAC to each hazard to assist management with prioritization of resources to abate the most critical deficiencies. The RAC assigned to each hazard is an expression of risk, combining the severity and the probability of occurrence. Section 1.23.6.e of this section details RAC criteria and definitions.
- Debrief. The inspector shall disclose anticipated findings of the inspection to a facility representative prior to leaving the facility.
- IAS. The inspector or designee shall document the inspection, safety deficiencies, and abatement recommendations in IAS within 30 days of finishing the facility inspection.

b. Findings

- Imminent Danger Conditions. If an imminent danger condition (RAC-1 or RAC-2) is identified by anyone at any time, the management official in charge will initiate corrective/protective action immediately, stop the operation, and restrict access to the area.
- Notice of Unsafe or Unhealthful Condition. If the inspector identifies a RAC-1 or RAC-2 deficiency, they will transmit a written “Notice of Unsafe or Unhealthful Condition” to the site supervisor, then immediately and visibly posted where the hazardous condition exists. The written notice shall be posted for three working days or until the condition is abated, whichever is longer. If not practical to post where the condition exists, the written notice shall be posted where it is readily observable by anyone potentially affected by the hazard. Once the inspector has completed the “Notice of Unsafe or Unhealthful Condition” form, they shall forward a copy shall to the site supervisor for review, action, and posting. The notice will contain the following minimum information:

  - location of the hazard,
  - description of the nature and extent of the hazard,
  - RAC,
  - description of the mitigation control measures,
  - interim RAC for interim control measures,
  - reference to applicable safety or health standards, and
  - estimated date for final abatement of the hazard.

c. Documentation

All deficiencies identified in the annual safety inspection shall be documented in IAS. Deficiencies identified outside of annual inspection shall be entered in IAS if classified as RAC-1

and RAC-2, or abatement requires funding beyond normal maintenance budget allocations. All records generated as part of this process shall conform with Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

- Required Information. Deficiencies or out-of-compliance discoveries are input in IAS and records are generated as findings. The minimum information required to generate a finding is:

  - category or type of finding,
  - description of finding or out of compliance issue,
  - severity and probability (RAC), and
  - reference to applicable safety or health standard.

- Lack of Deficiencies. For inspections without recordable deficiencies or findings, a record of inspection must be created in IAS and the inspector must record the categories and questions looked at during the inspection.

d. Abatement

The initial abatement time frames shall be in line with 485 DM 6, see Table 1.23-1. for timeframes.

TABLE 1.23-1: Initial Abatement Timeframes

Risk Assessment Code	Associated Timeframe
1	As soon as possible, within the work shift
2	As soon as possible, no later than 15 days
3	Within 12 months
4	Within 1 budget cycle, but no longer than 2 years
5	Incorporate abatement into the 5-year plan

- Updates. Inspectors or area office safety professionals shall update the status in IAS, quarterly until all inspection findings are abated.
- Review. Area office safety professionals will be responsible for a quarterly review of all open findings in IAS.
- Resources. If abatement of a hazardous condition is not within the authority or available resources of Reclamation, the area office safety professional shall inform potentially affected employees; inform and request assistance from the regional safety manager, and if necessary, the next higher management level; and coordinate with the appropriate federal agency (e.g., General Services Administration) to ensure abatement.

e. Risk Assessment Codes

The RAC assigned to each hazard is an expression of risk, combining the severity and probability of a hazardous condition resulting in an accident. The exposure of personnel to a hazard is an integral part of the probability determination and shall be considered when assessing the likelihood of a hazard resulting in an accident, injury, or illness.

- Risk Assessment Matrix. When assigning the RAC to an inspection finding, the inspector shall consult the Risk Assessment Matrix, see Table 1.23-2. The Risk Assessment Matrix shall serve as a tool to consistently assign the RAC to findings. Changing the RAC score shall reflect the existing conditions of the finding and not changed to inflate or minimize the priority for abatement.

TABLES 1.23-2: Risk Assessment Codes

Severity Codes	Severity Code Descriptions
Catastrophic (I)	Imminent and immediate danger of death or permanent disability, chronic or irreversible illness, major property damage, or resource damage.
Critical (II)	Permanent partial disability, temporary total disability greater than 3 months, significant property, or resource damage.
Significant (III)	Hospitalized minor injury, reversible illness, period of disability of 3 months or less, loss or restricted workday accident, compensable injury or illness, minor property, or resource damage.
Minor (IV)	First aid or minor medical treatment. Presents minimal threat to human safety and health, property, or resources, but is still in violation of a standard.

Probability Codes	Probability Code Descriptions
Frequent (A)	Immediate danger to health and safety of the public, staff, or property and resources; occurs frequently or continuously.
Likely (B)	Probably will occur in time if not corrected, or probably will occur one or more times during the life of the system.
Occasional (C)	Possible to occur in time if not corrected.
Rarely (D)	Unlikely to occur; may assume exposure will not occur.

Severity Code	Probability Code	Overall Risk Assessment Code
Catastrophic (I)	Frequent (A)	RAC 1
Catastrophic (I)	Likely (B)	RAC 2

Severity Code	Probability Code	Overall Risk Assessment Code
Catastrophic (I)	Occasional (C)	RAC 3
Catastrophic (I)	Rarely (D)	RAC 4
Critical (II)	Frequent (A)	RAC 1
Critical (II)	Likely (B)	RAC 2
Critical (II)	Occasional (C)	RAC 3
Critical (II)	Rarely (D)	RAC 4
Significant (III)	Frequent (A)	RAC 1
Significant (III)	Likely (B)	RAC 2
Significant (III)	Occasional (C)	RAC 3
Significant (III)	Rarely (D)	RAC 4
Minor (IV)	Frequent (A)	RAC 1
Minor (IV)	Likely (B)	RAC 2
Minor (IV)	Occasional (C)	RAC 3
Minor (IV)	Rarely (D)	RAC 4

- Numerical Scale. RAC levels are identified by a numerical scale, with RAC-1 being the most critical requiring immediate response and RAC-5 being the least critical.

    - RAC-1 (Critical). Represents an immediate danger to life, health, or infrastructure and requires emergency correction or hazard controlled to a lower level of risk.
    - RAC-2 (Serious). Represents a high level of threat to life, health, or infrastructure and requires hazard correction or hazard controlled to a lower level of risk as soon as possible.
    - RAC-3 (Moderate). Represents a medium level risk to life, health, or infrastructure, with correction planned and completed, or hazard controlled to a lower level of risk.
    - RAC-4 (Minor). Represents a low-level risk, with correction planned and completed, or hazard controlled to a lower level of risk.
    - RAC-5 (Negligible). Represents the lowest or most minor level risk. The correction of these risks can be planned as soon as is reasonable.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 1.24 Collateral Duty Safety Representatives

1. Scope

This section specifies the minimum requirements for establishing and maintaining appropriate levels of Collateral Duty Safety Representative (CDSR) resources within Reclamation organizations. This section does not apply to volunteer or contractor personnel or organizations.

2. General Requirements

Reclamation shall provide sufficient staff to support safety and occupational health (SOH) program delivery and oversight at all levels. Regional and area staff includes safety managers, safety specialists, industrial hygienists, and CDSRs to advise management in the development and implementation of effective SOH programs. Managers must address the development and retention of safety management expertise within their facilities. Where appropriate, management will identify CDSR personnel to support full-time safety managers and specialists. CDSR duties comprise less than 25 percent of the CDSR's work time, are not the primary purpose nor primary duty of the position, and do not represent grade-controlling responsibilities. If SOH CDSR responsibilities comprise more than 25 percent of the employee's work time, these duties are to be included in the employee's position description. See Department Manual 485, Chapter 28, Appendix 2 for examples and the performance plan. CDSR additional duties shall be documented using DI-625, Position Classification Amendment.

3. Responsibilities

a. Regional and Denver Office Directors

- Shall provide adequate SOH staffing resources to develop, implement, and administer an effective SOH program for the regional office building(s)/campus, field offices, and Denver Office buildings.
- Shall designate a regional/Denver safety professional as the CDSR coordinator for regional office building(s)/campus and Denver Office buildings.
- Shall designate CDSR personnel where appropriate to ensure accountability and coverage for organizational structures and physical spaces relative to building/campus needs.
- Shall provide CDSR personnel with adequate on-duty time to perform CDSR related duties.
- Shall provide CDSR personnel with adequate equipment and resources to perform their assigned duties.
- Shall provide CDSR personnel with training, shadow opportunities, and other learning experiences necessary to effectively perform their assigned duties.

- Shall ensure CDSR personnel report all safety and health related matters to the Regional/Denver Safety Manager if unable to resolve the matter at a local level and/or through the typical chain of command.

b. Area, Field, and Facility Managers

- Shall provide adequate SOH staffing resources to develop, implement, and administer an effective SOH program.
- Shall appoint or designate, in writing, and train CDSR personnel to meet this section's minimal requirements.
- Shall provide CDSR personnel with adequate on-duty time to perform CDSR related duties.
- Shall provide CDSR personnel with adequate equipment and resources to perform their assigned duties.
- Shall provide CDSR personnel with training, field experience, shadow opportunities, and other learning experiences necessary to effectively perform their assigned duties.
- Shall ensure CDSR personnel report directly to the area, field, or facility manager for all safety and health related matters.

c. Regional/Area Office Safety Professionals

- Shall make routine contact, at least quarterly, with CDSR personnel in their local areas to ensure effective implementation of local SOH programs.
- Shall ensure the necessary training and support for assigned CDSR personnel so they can properly and effectively carryout their assigned CDSR duties.

d. Collateral Duty Safety Representatives

- Shall complete training as prescribed in section 1.24.4, Training and Development.
- Shall consult and coordinate with their local SOH professional as needed.
- Shall effectively prioritize their safety related duties.
- Primary duties of CDSR personnel include:

    - assisting in planning, organizing, and evaluating SOH efforts,
    - supporting supervisors in facilitating the development of safe work practices,
    - assisting in the identification of risk management procedures to eliminate or minimize exposures to hazards,
    - participating in local risk management and hazard assessment efforts,
    - facilitating the development of safety action or implementation plans,
    - assisting with facility safety inspections,
    - assisting in the coordination and scheduling of SOH training,
    - supporting accident investigations and learning review activities,
    - assisting employees and supervisors in reporting incidents, occupational illnesses, and near misses using the Safety Management Information System,

- attending safety council and/or committee meetings, and
- where reasonable, participating in a minimum of two facility safety inspections annually.

4. Training and Development

a. Training

- Within the first 6 months of their assignment, CDSR personnel will complete the Federal Occupational Safety and Health Administration's Collateral Duty Course for Other Federal Agencies.
- Local safety and health professionals will provide CDSR personnel with training in addition to the Reclamation Safety and Health Standards (RSHS) applicable to the programs they support.
- CDSR personnel will complete relevant SOH coursework and retained within the Department's learning management system (DOI Talent), as prescribed by the local Manager, in consultation with the local SOH professional, taking into consideration hazardous job conditions as documented in local job hazard analyses.
- CDSR personnel will make themselves familiar with RSHS and procedures related to the reporting, evaluation, and abatement of hazards, the risk management process, mishap reporting and investigations, lessons learned reviews, and any local safety- related standard operating procedures, rules, or policies.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.01 Exposure to Hazardous Chemicals in Laboratories

1. Scope

This section establishes requirements for Bureau of Reclamation facilities where employees are engaged in "laboratory use" of hazardous chemicals in accordance with Federal Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories.

2. General Requirements

a. Program Application

Laboratory use applies to handling or using hazardous chemicals when the conditions below are met:

- chemical procedures are carried out on a "laboratory scale" basis,
- multiple chemical procedures or hazardous chemicals are used,
- procedures involved are not part of a production process, or simulate a production process, and
- protective laboratory practices and equipment are available to minimize the potential for employee exposure to hazardous chemicals.

b. Facilities Meeting Laboratory Use

When paragraph 2.01.2.a, Program Application of this Reclamation Safety and Health Standard (RSHS) applies, it shall supersede laboratory requirements of all other OSHA health standards in Federal OSHA 1910, subpart Z, except as follows:

- for any OSHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit (PEL) shall apply, unless that standard states otherwise,
- where the action level (AL) is routinely exceeded (or in the absence of an AL, the PEL), for an OSHA-regulated substance with exposure monitoring and medical surveillance requirements, then paragraphs 2.01.7, Employee Exposure Determination and 2.01.8, Medical Examinations and Consultation of this RSHS apply, and/or
- any OSHA health standard prohibiting eye and skin contact.

3. Responsibilities

a. Area Office Managers

- Shall provide resources to implement and maintain the procedures within this section.

b. First-Line Supervisors

- Shall provide resources and support for the implementation of this section.
- Shall select a Chemical Hygiene Officer (CHO) to provide technical guidance for developing the Chemical Hygiene Plan (CHP).
- Shall coordinate with the CHO to provide training according to paragraph 2.01.4.a, Initial Training of this RSHS, for employees in laboratory areas where they have potential exposure to hazardous chemicals.
- Shall provide the appropriate engineering controls and personal protective equipment (PPE) for employees in laboratory areas where they have potential exposure to hazardous chemicals.
- Shall ensure the job hazard analysis (JHA) and/or standard operating procedure (SOP) documents use the hierarchy of controls for each chemical process and are reviewed with employees prior to use.
- Shall ensure engineering control malfunctions are immediately reported and repaired before placing the equipment back into service.
- Shall coordinate with the CHO and the regional/local industrial hygienist (IH) to review if any laboratory employees are using hazardous chemicals that meet Federal OSHA standards requiring monitoring and if exposure levels could exceed the AL (or in the absence of an AL, the PEL).

c. Regional Safety Managers

- Shall assist in providing the necessary resources to develop, establish, and maintain an effective CHP, when requested.

d. Regional/Local Industrial Hygienist

- Shall provide technical assistance to the first-line supervisor and CHO on topics such as exposure monitoring, medical surveillance, training, respirator selection, fit-testing, and engineering control(s) evaluation.

e. Chemical Hygiene Officers

- Shall coordinate with the first-line supervisor and, if needed, with the local hazard materials coordinator to ensure employees understand proper chemical handling, storage, transportation, and disposal requirements.
- Shall coordinate with the first-line supervisor to provide initial and ongoing CHP training for all laboratory employees.
- Shall conduct periodic laboratory inspections ensuring laboratory employees have stored and labeled chemicals properly, the appropriate PPE is available and in good condition, safety data sheets are available for all hazardous chemicals in the laboratory, and engineering controls are working properly.
- Shall coordinate with the first-line supervisor to develop and implement the CHP.

- Shall review the CHP annually, make any updates, and ensure employees are provided training on any changes.

f. Employees

- Shall complete training according to paragraph 2.01.4.
- Shall review the JHA and/or SOP(s) before conducting the job task(s).
- Shall use required PPE and engineering controls outlined in the JHA and/or SOP(s).
- Shall immediately inform their first-line supervisor and/or CHO of any engineering controls in the laboratory that are not functioning properly.
- Shall only perform job tasks using hazardous chemicals they are trained to use.
- Shall ensure containers in the laboratory are labeled properly and shall properly handle, transport, and dispose of hazardous chemicals according to the CHP.
- Shall immediately report any exposure signs or symptoms of the hazardous chemicals they use to their first-line supervisor and/or CHO.
- Shall complete medical exams outlined in paragraph 2.01.8, Medical Examinations and Consultation of this RSHS, and RSHS Section 2.08, Respiratory Protection Program, if respiratory protection is or will be used.

g. Human Resources Officers

- Shall work in coordination with regional medical coordinators to obtain and maintain medical examination results and employee exposure monitoring records in the employee's medical folder according to 29 CFR 1910.1020(d)(1), Access to Employee Exposure and Medical Records, the Privacy Act of 1974 (P.L. 93-579), and provide the regional/local IH, CHO, and/or first-line supervisor with the clearance results as requested.

4. Training

a. Initial Training

First-line supervisors shall conduct and/or coordinate employee training on the hazardous chemicals in their work area(s) and any new job tasks(s) where there is potential for exposure to hazardous chemicals. At a minimum, training shall include the following elements:

- contents of the laboratory standard and its appendices,
- location and availability of the CHP,
- PELs for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard,
- signs and symptoms associated with exposures to hazardous chemicals used in the laboratory,

- location and availability of known reference materials on the hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory including, but not limited to, the safety data sheets received from the chemical supplier,
- measures workers can take to protect themselves from these hazards, such as appropriate work practices, emergency procedures, and personal protective equipment to be used, and
- applicable details of the CHP.

b. Refresher Training

The first-line supervisor and/or CHO shall determine the frequency of refresher training. Any employees found not following the practices and/or procedures in the CHP, JHA(s), and/or SOP(s) shall receive refresher training from the first-line supervisor and/or CHO on the correct practices and/or procedures prior to resuming work with hazardous chemicals within the scope of this section.

5. Reclamation Recordkeeping

All training records shall be kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, RCD 05-01, Information Management.

6. Chemical Hygiene Plan

The first-line supervisor in coordination with the CHO shall develop and implement the CHP that includes the following elements:

- SOPs relevant to safety and health considerations for each activity involving the use of hazardous chemicals,
- criteria used to determine and implement control measures to reduce exposure to hazardous materials (e.g., engineering controls, substitution, administrative controls, PPE, and hygiene practices), with particular attention given to selecting control measures for extremely hazardous chemicals/materials,
- procedures to ensure fume hoods and other engineering controls are functioning properly within the manufacturer’s recommendations,
- training elements covered in paragraph 2.01.4.a,
- criteria to determine if and when a particular laboratory operation, procedure, or activity requires approval from the first-line supervisor and/or CHO prior to implementation,
- names of employees responsible for implementing the CHP, including the assignment of a CHO,
- any additional employee protection for working with particularly hazardous substances including select carcinogens, reproductive toxins, and substances that have a high

degree of acute toxicity (i.e., using designated areas, containment devices, safe removal of contaminated wastes, and decontamination procedures), and
- requiring that the CHO must review and evaluate the effectiveness of the CHP at least annually and make updates as necessary.

7. Employee Exposure Determination

a. Initial Monitoring

The first-line supervisor and/or CHO shall coordinate with the regional/local IH to perform monitoring for employees with the potential for exposure to any hazardous chemicals that meet Federal OSHA standards requiring monitoring, if there is reason to believe that exposure levels may routinely exceed the AL (or in the absence of an AL, the PEL).

b. Periodic Monitoring

If the initial monitoring in paragraph 2.01.7.a, Initial Monitoring, of this RSHS indicates an employee exposure is over the AL (or in the absence of an AL, the PEL), then the first-line supervisor and/or CHO, in coordination with the regional/local IH, must immediately implement exposure monitoring and termination of monitoring provisions of the appropriate Federal OSHA standard.

c. Employee Notification of Monitoring Results

The regional/local IH shall coordinate with the first-line supervisor and/or the CHO to contact affected employees in writing within 15 working days after receiving any monitoring results.

8. Medical Examinations and Consultation

a. First-Line Supervisors.

The first-line supervisor shall provide all laboratory employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations that the examining physician determines necessary, under the following circumstances:

- when an employee develops signs or symptoms associated with a hazardous chemical they have been exposed to in the laboratory,
- if exposure monitoring indicates an employee exposure level is routinely above the AL (or in the absence of an AL, the PEL) for an OSHA regulated substance that has exposure monitoring and medical surveillance requirements, then the regional/local IH must establish medical surveillance according to that particular standard for the affected employee(s), and
- whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee(s) must be provided an opportunity for a medical consultation to determine the need for a medical examination.

b. Medical Examinations and Consultations

The first-line supervisor, in coordination with the CHO, employees, and/or regional/local IH, shall ensure a licensed physician performs or directly supervises all medical examinations and consultations without cost to the employee, without loss of pay or use of leave (annual or sick), and at a reasonable time and place.

9. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment

The first-line supervisor, in coordination with the CHO and/or regional/local IH, shall conduct a hazard assessment for their laboratory, and at a minimum, include the following:

- identifies the chemicals used covering the different laboratory procedures and determine if any laboratory conditions or employee tasks could create or increase a hazard,
- evaluates the hazards of the chemicals used in the procedures (e.g., toxic, physical, reactive, flammable, explosive, and biological hazards),
- identifies appropriate controls to minimize risk, such as engineering controls, administrative controls, and PPE, and
- identifies and document emergency procedures to take in the event of an accident.

b. Hierarchy of Controls

The first-line supervisor and/or CHO shall review the JHA identifying the appropriate controls below to reduce employee exposures below the AL, and/or PEL, when performing job tasks using Federal OSHA regulated substances:

- local exhaust systems and fume hoods,
- general laboratory ventilation,
- chemical substitution to less hazardous chemicals,
- specific laboratory procedures outlined in the CHP or laboratories procedure manual,
- identification of relevant SOPs,
- PPE specific to each hazard, ensuring the PPE fits properly and the employee is trained in its use, removal, storage, maintenance, and disposal per manufacturer specifications, and
- emergency procedures and equipment.

10. Pre-job Briefing and Planning Requirements

a. JHA

The first-line supervisor and/or CHO shall complete and review a JHA with employee(s) prior to the job task(s) identifying hazards, their controls, and necessary PPE to ensure that the exposure associated with the activity is minimized.

11. Personal Protective Equipment (PPE)

First-line supervisors and/or CHO shall provide and train employees in the use of required PPE to eliminate or minimize the risk of exposure to hazardous chemicals in the laboratory.

a. Respiratory Protection

Employees shall use respiratory protection and adhere to the requirements in the RSHS Section 2.08 when:

- exposure to a Federal OSHA regulated substance exceeds the AL or PEL if an AL has not been established,
- engineering and work practice controls are not adequate to reduce exposures below the AL or below 50 percent of the PEL, and
- when interim protection measures are in place during an exposure assessment.

b. Additional PPE Selection

Refer to RSHS Section 1.07, Personal Protective Equipment, for selection, use, and maintenance requirements for additional PPE identified in the JHA.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.02 Asbestos

1. Scope

This section applies to Bureau of Reclamation facilities to protect employees performing Class I, II, III, and IV asbestos work operations from occupational asbestos exposure covered in Federal Occupational Safety and Health Standards (OSHA) 29 CFR 1926.1101, Asbestos. This section does not apply to asbestos-containing asphalt roof coatings, cements, and mastics. Other work operations with potential exposure to asbestos, that do not fall under Class I- IV work, shall follow the requirements outlined in 29 CFR 1910.1001, Asbestos.

2. General Requirements

a. Permissible Exposure and Excursion Limits

Reclamation's goal is to eliminate or reduce employee exposure to asbestos containing materials (ACM). No employee shall be exposed above the permissible exposure limit (PEL) of 0.1 fiber per cubic centimeter (f/cc) of air as an 8-hour time weighted-average (TWA), or the excursion limit (EL) of 1.0 f/cc averaged over a 30-minute sampling period, analyzed by the methods outlined in 29 CFR 1926.1101, Appendix A, or other equivalent method.

b. Asbestos Containing Material

In the absence of analytical data to the contrary, all Reclamation staff and facilities must treat all thermal system insulation (TSI), sprayed/troweled-on surfacing materials, and resilient flooring material installed before 1980 as ACM.

c. Asbestos Disposal

Asbestos disposal requirements shall follow the Federal/State/local regulations where the site/facility is located.

3. Responsibilities

a. Area Office Managers/Facility Managers

- Shall select a competent person(s) (CP) who can identify asbestos hazards and has the authority to correct these hazards.
- Shall provide the necessary resources to implement and maintain the procedures within this section.

b. Competent Persons

- Shall complete a training course for Class I-II work that meets the criteria of the Environmental Protection Agency's (EPA) Model Accreditation Plan (40 CFR part 763, Subpart E, Appendix C) for supervisors, or a course that is equivalent in stringency, content, and length.

- Shall complete a training course for Class III-IV work that is consistent with EPA requirements for training of local education agency maintenance and custodial staff in 40 CFR 763.92(a)(2), or its equivalent in stringency, content, and length.
- Shall conduct inspections for Class I work during each shift or at an employee's request.
- Shall perform or oversee the following duties for Class I or II asbestos work:

    - setup of the regulated area, enclosure, or other containment and periodically inspect its integrity during the job task(s),
    - setup procedures to control entry to and exit from the enclosure and/or area,
    - in consultation with the regional/local industrial hygienist, shall oversee all employee exposure monitoring to appropriately address all elements of this section,
    - ensure employees working within the containment area and/or using glove bags wear respirators and protective clothing,
    - ensure employees use hygiene facilities and follow decontamination procedures, and
    - ensure that that engineering controls are set up and working properly, and employees are using proper work practices and personal protective equipment (PPE).

- Shall oversee all asbestos work performed within regulated areas.
- Shall maintain the site inventory of presumed asbestos containing building material (PACM) and ACM that includes location, type of material, quantity, and condition of the material.
- Shall coordinate with the first-line supervisor and the regional/local industrial hygienist to review asbestos work plans for conducting an exposure assessment before, or during, asbestos operations to identify expected asbestos exposures.
- Shall examine protective clothing during asbestos work operations at least once per shift immediately repairing damages or replacing them.
- Shall conduct and coordinate with the regional/local industrial hygienist to perform air monitoring for exposure assessments or provide objective data for a negative exposure assessment.
- Shall receive the appropriate asbestos training and/or air monitoring certifications if required by states where they are performing work.
- Shall review the job hazard analysis (JHA) and/or asbestos work-plan with the first-line supervisor before conducting the asbestos job task(s) and follow the identified precautions.
- Shall send employee monitoring results to the regional/local industrial hygienist for review.

c. First-Line Supervisors

- Shall ensure employees receive training according to paragraph 2.02.4, Training of this Reclamation Safety and Health Standard (RSHS), before performing Class I-IV asbestos work and that they are aware of any ACM and/or PACM identified in the site inventory.
- Shall notify the CP of asbestos work at least 2 weeks before the start of the job or immediately upon becoming aware of emergency asbestos work.
- Shall coordinate with the CP, and/or the regional/local industrial hygienist, any required medical exams for their employees performing asbestos work as outlined in paragraph 2.02.9.g, Medical Surveillance.
- Shall coordinate with the CP to ensure products and containers holding asbestos and asbestos waste are labeled according to paragraph 2.02.9.e, Labeling.
- Shall ensure the JHA includes the appropriate elements in paragraph 2.02.9.a, Workplan Elements, and review the JHA with the employees before starting asbestos work operations.

d. Class I–IV Asbestos Workers

- Shall complete the training requirements in paragraph 2.02.4.
- Shall review the JHA and asbestos workplan with the first-line supervisor and/or the CP before conducting the asbestos job task(s) and follow the identified precautions.
- Shall initiate stop work procedures when necessary.
- Shall complete baseline medical and periodic exams as required by paragraph 2.02.9.g and RSHS Section 2.08, Respiratory Protection Program.

e. Regional Safety Manager

- Shall assist in developing and establishing an asbestos program, when requested, and coordinate periodic spot checks to ensure compliance with this section.

f. Regional and Local Industrial Hygienists

- Shall provide technical assistance to the CP such as exposure monitoring, medical surveillance, engineering control(s) evaluation, objective data documentation, respirator selection, and fit testing.
- Shall receive the appropriate asbestos training and/or air monitoring certifications if required by states where they are performing work.
- Shall review employee monitoring results performed by the CP to appropriately address elements of this section.

g. Project Managers/Acquisitions

- Shall coordinate with the regional safety office, as necessary, in the selection of contractors who answer solicitations to perform asbestos abatement activities before final selection.

- Shall ensure the following minimum elements are in the solicitation package that contractors need to provide for asbestos abatement activities:

    - license for asbestos abatement work for the location where the work will be performed,
    - insurance and binders for asbestos abatement, and
    - detailed 5-year history of all Federal/State OSHA, EPA, and Air Management Agency citation history.

h. Human Resources Officers (HRO)

- Shall maintain any medical examination results, clearance documentation, and employee exposure monitoring records in the employee's medical folder according to paragraph 2.02.9.g.(5), Medical Monitoring Records of this section; 29 CFR 1910.1020(d)(1), Access to Employee Exposure and Medical Records; the Privacy Act of 1974 (P.L. 93-579); and provide the regional/local industrial hygienist, the CP, or first-line supervisor with the clearance results, as requested.

i. Joint Host and Contract Employer

- The site/facility shall inform contractors performing work at their locations of the types and quantities of all ACM and/or PACM in their work area they may encounter during their job task(s).
- The contractor shall stop work if ACM or suspected ACM is discovered and no provision for asbestos work is in the contract solicitation. The contracting officer shall decide whether to continue or not.
- The contract employer and/or the site/facility may designate a material previously documented as PACM as non-ACM if testing validates and supports that the material does not contain more than 1 percent asbestos. Testing shall include analysis of bulk samples collected as described in 40 CFR 763.86, Sampling. The CP shall keep the information, data, and analysis supporting the determination that PACM does not contain asbestos.
- Contractors shall have a CP for worksites where ACM/PACM may be found and shall include the CP's qualifications in their site safety and health plans.

4. Training Requirements

a. Class I and II Workers

Training for Class I and Class II operations using critical barriers or equivalent isolation methods, and/or negative pressure enclosures shall be equal to the curriculum, training method, and length outlined in the EPA Model Accreditation Plan asbestos abatement workers training (40 CFR Part 763, Subpart E, Appendix C). Courses must be conducted by an EPA-approved or State-approved training provider; certified by EPA or the State; and be equivalent in stringency, content, and length (i.e., 5 days, at least 14 hours of hands-on training).

b. Class II Additional Requirements

In addition to the requirements in paragraph 2.02.4.a, Class I and II Workers of this RSHS, all work with asbestos-containing roofing materials, flooring materials, siding materials, ceiling tiles, or transite panels, shall meet the specific work practices and engineering controls specifically used for the job task(s). The course shall include 8 hours of hands-on training.

c. Class III Workers

Training for Class III work shall be consistent with EPA requirements in 40 CFR 763.92(a)(2) for maintenance and custodial staff and include 16 hours of hands-on training.

d. Class IV Workers

Training shall be consistent with EPA requirements in 40 CFR 763.92(a)(1) for maintenance and custodial staff and shall include at least 2 hours of instruction.

e. Awareness Training for Employees Not Performing Class I–IV Work

The JHA that contains the requirements of this section shall identify employees with potential exposure above the PEL, and shall receive training on the following:

- adverse health effects of asbestos exposure,
- the relationship between smoking and asbestos in causing lung cancer,
- operations that could result in asbestos exposure and the importance of protective controls,
- the purpose, proper use, fitting instructions, and limitations of respirators,
- appropriate work practices for performing asbestos jobs,
- medical surveillance program requirements,
- the contents of the OSHA asbestos standard,
- the names, addresses, and phone numbers of public health organizations that provide information and materials or conduct smoking-cessation programs, and
- the required signs and labels and their meanings.

f. Competent Person Training

CPs shall complete a training course that meets the criteria of EPA's Model Accreditation Plan for supervisors, and a course for Class III and Class IV work that is consistent with EPA requirements local education agency maintenance and custodial staff training in 40 CFR 763.92(a)(2).

g. Refresher/Recertification

CPs and employees performing Class I-IV work shall receive annual training to maintain certification requirements.

h. Lack of Proficiency

Retraining is necessary when the CP or an employee performing Class I-IV work demonstrates a lack of knowledge of asbestos work practices or the program elements in this section.

i. Recordkeeping

All training records shall be kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment–Inventory

The CP shall coordinate bulk sampling where there is the probability for ACM and maintain an inventory of known ACM locations for each site/facility they are responsible for.

b. Safety Measures

- Hierarchy of Controls. The first-line supervisor and the CP shall review the JHA/asbestos work plan to identify the appropriate controls, below, to reduce asbestos exposure below the PEL and/or EL when performing asbestos work activities:

    - enclose or isolate processes producing asbestos dust,
    - provide a portable air ventilation system equipped with a high-efficiency particulate air (HEPA) filter to provide negative air pressure preventing airborne asbestos from escaping from the enclosure,
    - implement engineering and work practices to reduce exposures to the lowest possible level and supplement with respiratory protection,
    - equip vacuum cleaners with HEPA filters to collect debris and dust from the work area after asbestos removal,
    - use wet methods or appropriate alternatives if they do not cause electrical hazards, equipment malfunction, slipping hazards, or other hazards,
    - establish hygiene facilities outlined in paragraph 2.02.8, Hygiene Facilities, and
    - promptly clean up and dispose of asbestos-contaminated wastes and debris in sealed, labeled, impermeable bags (minimum 6 mil thickness) or other closed, labeled, leak-tight containers.

- Prohibited Work Practices. The CP, in coordination with the first-line supervisor, shall implement the following work practices so ACM or PACM is not disturbed, regardless of any measured asbestos exposure levels:

    - no high-speed abrasive disc saws used not equipped with point-of-cut ventilator or enclosures with HEPA filtered exhaust,

- no compressed air use to remove ACM, unless it is used within an enclosed ventilation system designed to capture the dust cloud created by the compressed air,
- no dry sweeping, shoveling, or other dry clean-up of dust, and debris containing ACM and/or PACM, and
- no employee rotation as a means of reducing employee exposure to asbestos.

6. Pre-job Briefing and Planning Requirements

a. JHA.

The first-line supervisor, in coordination with the CP, shall ensure Class I-IV asbestos work operations have a written JHA that includes the appropriate elements in paragraph 2.02.9.a, Workplan Elements of this RSHS, and shall review the JHA with employees before starting asbestos work operations.

7. Personal Protective Equipment (PPE)

a. Respiratory Protection

The CP, in coordination with the first-line supervisor, shall ensure employees wear respiratory protection in the following instances and adhere to the requirements in RSHS Section 2.08, Respiratory Protection Program:

- Class I work,
- Class II and III work performed, not using wet methods with the exception or removal of ACM from sloped roofs, when a negative exposure assessment has been conducted and ACM is removed in an intact state,
- Class II and III asbestos work for which a negative exposure assessment has not been conducted,
- Class III asbestos work when TSI or surfacing ACM or PACM is disturbed,
- Class IV asbestos work performed within regulated areas where employees performing other work are required to use respirators, and
- work operations covered by this section where employees are exposed above the PEL or EL, or in emergencies such as an asbestos spill or an emergency clean- up.

b. Protective Clothing

- Class I Work Requirements. The CP shall ensure Reclamation employees use protective clothing when exposed to airborne concentrations of asbestos that exceed the PEL and/or EL or for Class I work that involves the removal of over 25 linear or 10 square feet of TSI, or surfacing ACM and PACM where a negative assessment has not been completed.
- Laundering of Contaminated Clothing. The CP shall inform the offsite professional laundering service, if used, that the clothing was used for asbestos work and ensure contaminated clothing is transported in sealed impermeable bags, or other closed

impermeable containers, and labeled according to paragraph 2.02.9.e.(1), Products, Bags and Containers with Asbestos of this RSHS.

8. Hygiene Facilities

a. Requirements for Class I Reclamation Asbestos Work Activities

The CP shall set up a decontamination area for asbestos job tasks involving more than 25 linear or 10 square feet of TSI or surfacing ACM and PACM. The decontamination area shall include an equipment room, shower area, and a clean room, set up in series, for the asbestos workers to enter and exit from.

- Equipment Room. The CP shall ensure the equipment room has impermeable bags or containers for disposing protective clothing.
- Shower Area. The CP shall ensure the shower area meets the requirements in 29 CFR 1910.141(d)(3) and is set up adjacent to the equipment and clean rooms. If there is not a feasible location for the shower area adjacent to the work area, then the CP shall ensure asbestos workers:
    - use a HEPA vacuum to remove any asbestos contamination from their protective clothing before they enter the shower area, or
    - remove their contaminated clothing in the equipment room and put on clean protective clothing before they enter the shower area.
- Clean Room. The CP shall ensure the clean room has an appropriate storage container for each asbestos worker. If it is not feasible to provide a clean change area adjacent to the work area or where the employee performs the work outdoors, then asbestos workers may clean their protective clothing using a HEPA vacuum before leaving the regulated area. The asbestos workers must shower and change into their street clothing in the clean room.

b. Requirements of Class II–III Reclamation Asbestos Work Activities

The CP shall ensure that activities involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II-III asbestos work operations where exposures exceed the PEL or there was no negative exposure assessment, shall include the following:

- an equipment room/area by the regulated area for the decontamination of employees, protective work clothing, asbestos contaminated equipment, and has an impermeable drop cloth on the floor or horizontal working surface,
- an area large enough to allow equipment cleaning and removing PPE without spreading contamination beyond the area, and
- means to clean used equipment and surfaces of containers holding ACM debris before removal from the equipment room/area.

c. Requirements for Class Reclamation IV Work Activities

Employees performing Class IV work within a regulated area must follow the same hygiene practices required of those employees with the higher classification.

d. Smoking in Work Areas

Employees shall not smoke in any work areas where there may be occupational asbestos exposures.

9. Safe Practices

a. Asbestos Workplan Elements

The first-line supervisor and the CP shall ensure that Class I-III operations have an asbestos work-plan in place, or is part of the JHA, before starting asbestos work with the following minimum elements:

- physical description of the work area,
- description of the approximate type and amount of ACM for removal,
- schedule for turning off and sealing existing ventilation systems,
- employee hygiene procedures,
- description of PPE and protective clothing worn,
- description of the local exhaust ventilation system(s) used, including testing requirements,
- description of required employee work practices,
- an air monitoring plan for exposure assessment, and
- description of waste material for transport and disposal.

b. Regulated Areas

- Class I-III Asbestos Work. The CP shall ensure that Class I-III asbestos work conducted within regulated areas has visible warning signs at a distance so that employees can read the signs and take the necessary protective steps before entering. The warning signs shall include the following information when respirators are required in regulated areas:

FIGURE 2.02-1: Class I–III Asbestos Warning Signs

WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA

DANGER ASBESTOS

MAY CAUSE CANCER CAUSES DAMAGE TO LUNGS AUTHORIZED PERSONNEL ONLY

- Hygiene Practices. The CP shall ensure employees in regulated areas do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics within regulated areas.
- Regulated Area Supervision. The CP shall supervise asbestos work performed within regulated areas.

c. Exposure Assessments and Monitoring

- General Monitoring Requirements. The CP, in coordination with the regional/local industrial hygienist, shall conduct air monitoring during asbestos work activities. Air monitoring data shall represent an 8- hour TWA full shift exposure of the employees in the work area. In addition, the CP, in coordination with the regional/local industrial hygienist, shall conduct short-term employee exposure monitoring, lasting 30 minutes, during work activities that are most likely to produce exposures above the EL for employees in each work area.
- Initial Exposure Assessment. The CP, in coordination with the regional/local industrial hygienist, shall conduct an exposure assessment immediately before or at the initiation of the asbestos work operation(s) to determine expected exposures. The CP and/or the regional/local industrial hygienist must complete the assessment in time to comply with requirements that are triggered by exposure data, or the lack of a negative exposure assessment outlined in paragraph 2.02.9.d, Negative Exposure Assessment of this RSHS, and to provide information necessary to assure that all control systems planned are appropriate for that operation and are working properly.

    - Assessment Elements. The assessment shall consider monitoring results and observations, information, and calculations indicating employee asbestos exposure, and shall include any previous monitoring or other operations that indicate the levels of airborne asbestos likely to be encountered on the job.
    - Class I Work Requirement. Until the CP and/or the regional/local industrial hygienist conducts exposure monitoring or a negative exposure assessment, employees are considered exposed to asbestos above the PEL or EL.

- Observation of Monitoring. The CP, in coordination with the regional/local industrial hygienist, shall ensure that employees involved in asbestos work activities and their designated representative may observe any monitoring to determine employee exposure. The observer must wear proper PPE and follow all safety procedures if they enter the area to observe the monitoring.
- Employee Notification of Monitoring Results. The regional/local industrial hygienist and/or the CP shall contact affected employees ensuring and notify them in writing within 5 working days after their monitoring results were received by either the CP, the regional/local industrial hygienist, or the first-line supervisor.

- Recordkeeping. The regional/local industrial hygienist and/or the CP shall ensure monitoring records of an employee's potential asbestos exposure contain the following elements:

    - job task(s) monitored and date,
    - sampling/analytical method used,
    - number of samples and the length of time for each sample,
    - type of respiratory protection used and any other PPE, and
    - employee(s) name and their individual sample results.

d. Negative Exposure Assessment.

The CP, in coordination with the regional/local industrial hygienist, may demonstrate employee exposure(s) for specific asbestos job task(s) performed by Class I-IV employees are below the PEL and EL by documenting that asbestos fibers cannot be released, using prior exposure monitoring results, or using objective data as outlined below. The CP must keep documentation in a manner that is readily accessible upon request.

- No Asbestos Fiber Release. The CP, in coordination with the regional/local industrial hygienist, must provide documentation that the product/material containing asbestos or the activity involving the product/material cannot release airborne fibers in concentrations exceeding the PEL and EL under those work conditions having the greatest potential for releasing asbestos.
- Prior Monitoring for Asbestos Job Tasks. The CP, in coordination with the regional/local industrial hygienist, must provide documentation that prior asbestos job tasks were monitored for the PEL and EL within 12 months of the current or projected job and the data was obtained during work operations/workplace conditions that meet the following:

    - must closely resemble the processes, type of material, control methods, work practices, and environmental conditions that exist in the site's current operations,
    - the operations performed by employees whose training and experience are no more extensive than that of employees performing the current job,
    - the data shows that under the conditions in the current workplace there is a high degree of certainty that employee exposures will not exceed the PEL and EL, and
    - the results of initial exposure employee monitoring for the current job are representative of the PEL and EL for each employee job tasks performed during the entire asbestos job.

- Objective Data. The CP, in coordination with the regional/local industrial hygienist, shall use objective data to show the products made from or containing asbestos, or the activity using those products/material are not capable of releasing asbestos fibers at or above the PEL or EL under the expected work conditions. The objective data must contain the following elements:

- the product qualifying for the exemption,
- the source of objective data,
- the testing protocol, results of testing, and/or analysis of the material for the release of asbestos fibers,
- other data relevant to the operations, materials, processing, or employee exposures covered by the exemption, and
- description of the operation exempted and how the data supported the exemption.

e. Labeling

- Products, Bags and Containers with Asbestos. The CP shall ensure that bags or containers of protective clothing and equipment used during asbestos operations, asbestos scrap/waste, and if feasible, products containing asbestos are labeled with the following information:

FIGURE 2.02-2: Asbestos Product Labels

DANGER **CONTAINS ASBESTOS FIBERS—DO NOT BREATHE DUST—AVOID CREATING DUST** **CANCER AND LUNG DISEASE HAZARD**

- Labeling Exceptions. Labels are not required when asbestos fibers have been modified by a bonding agent, coating or other material, or the manufacturer documents that airborne asbestos fibers will be not released above the PEL and/or EL when used reasonably, and the product contains less than 1 percent asbestos.
- Labeling/Signs for Installed PACM and ACM. The CP and first-line supervisor shall coordinate labeling/signage of previously identified ACM and/or PACM so employees with likely exposure are aware of its location(s) when entering the area.

f. Housekeeping

- Vacuuming Equipment. The CP, in coordination with the first-line supervisor, shall ensure vacuums used during asbestos work are equipped with a HEPA filter and used/emptied in a way that minimizes the reentry of asbestos into the workplace.
- Flooring Containing ACM. Reclamation prohibits sanding of asbestos-containing flooring and employees must use wet methods for stripping finishes using low abrasion pads at speeds less than 300 rpm.

g. Medical Surveillance

- Medical Surveillance for Class I–III Workers. The regional/local industrial hygienist, in coordination with CP, shall stablish a medical surveillance program for employees performing Class I, II, and/or III work for 30 or more days per year or are exposed at or

above the PEL. On any day employees performing Class II and/or Class III operations on intact material for 1 hour or less (that includes the time spent on removal and cleanup operations) and follows the work practices of this section does not count towards the 30-day threshold.

- Medical Examinations. The first-line supervisor, in coordination with the CP and/or the regional/local industrial hygienist, shall ensure their employees covered in paragraph 2.02.9.g.(1), Medical Surveillance for Class I-III Workers of this RSHS, receive medical exams and/or consultations by a licensed physician or under the supervision of a licensed physician as outlined below:

    - before an assignment to an area requiring negative-pressure respirators,
    - when an employee is assigned to an area where asbestos exposure may be at or above the PEL for 30 or more days per year, or perform Class I, II, or III work for a combined total of 30 or more days per year,
    - within 10 working days following the thirtieth day of exposure, and annually thereafter, and
    - when the physician determines that any of the exams should be provided more frequently than specified above.

- Medical Examination Elements. The first-line supervisor, in coordination with the CP and/or the regional/local industrial hygienist, shall ensure the physician receives a description of the affected employee's duties as they relate to their asbestos exposure, their representative or anticipated exposure level, and the type of respiratory equipment and other PPE used or will be used. Medical exams shall include the following minimum elements:

    - medical and work history with an emphasis on the pulmonary, cardiovascular, and gastrointestinal systems,
    - a physical exam of the pulmonary and gastrointestinal systems, including a chest x-ray administered at the discretion of the physician, a pulmonary function test, and
    - any other examinations or tests deemed necessary by the examining physician.

- Physician's Written Opinion. The CP, the first-line supervisor, and the regional/local industrial hygienist shall receive the physician's written opinion and ensure the employee receives the opinion within 30 days. The written opinion shall be sent to the HRO and must adhere to the Privacy Act of 1974 (P.L. 93-579) and not include specific findings or diagnoses unrelated to occupational asbestos exposure.
- Medical Exams and Monitoring Records Retention. The CP and/or first-line supervisor shall ensure any medical examination results, clearance documentation, and employee monitoring records are sent to the HRO and kept in the employee's medical file for the duration of the employee's employment, plus 30 years per 29 CFR 1910.1020, Access to Employee Exposure and Medical Records.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 2.03 Lead Exposure Control Program

1. Scope

The Lead Exposure Control Program (LECP) applies to all Bureau of Reclamation (Reclamation) owned facilities to provide protection from occupational exposure to lead for Reclamation employees performing construction and maintenance work activities covered in Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62, Lead, and 29 CFR 1910.1025, Lead.

2. General Requirements

a. Permissible Exposure and Action Level

Reclamation's goal is to limit employee exposure to lead during construction work activities. Employees must not experience exposure to an airborne lead concentration greater than the permissible exposure limit (PEL) of 50 microgram/cubic meter (µg/m³) as an eight-hour time weighted average (TWA). The competent person (CP) will implement additional measures when employee exposures meet or exceed the action level (AL) of 30 µg/m³ as an eight-hour TWA. If an employee is exposed to lead for more than eight hours in a workday, the PEL shall be reduced according to the following formula:

- Allowable employee exposure in µg/m³ = 400 divided by hours worked in the day. For example, employees working a shift of 10 hours a day, the exposure would be 400/10 = 40 µg/ m³.

b. Respirator Use

Employees must use respirators to limit exposure to airborne lead and a written respiratory protection program must be in place as outlined in Reclamation Safety and Health Standards (RSHS) Section 2.08, Respiratory Protection Program. First-line supervisors must implement engineering and work practice controls for employee exposure at the level provided by the respirator's protection factor when the respirator is worn. The periods of exposure may be averaged with exposure levels when respirators are not worn to determine the employee's daily TWA exposure.

c. Lead Waste Disposal

Lead waste disposal requirements shall follow Federal and local environmental regulations where the site/facility is located.

3. Responsibilities

a. Regional Safety Managers

- Shall assist in developing, establishing, and coordinating periodic reviews of regional LECPs.

b. Regional Industrial Hygienists (IH)

- Shall provide technical assistance to the CP such as exposure monitoring, respirator selection, fit testing, and training.

c. Area Office Managers

- Shall select an area office CP who can identify and correct lead hazards.
- Shall provide the necessary resources to implement and maintain procedures within the LECP.

d. Competent Persons

- Shall complete the training outlined in paragraph 2.03.4, Training Requirements.
- Shall perform frequent inspections of job sites(s), materials, and equipment where lead work is performed.
- Shall confirm engineering and work practice controls are outlined in the lead work plan.
- Shall successfully complete a hands-on training course given by their IH or a course that covers sampling methods, exposure limits, and dust/gas/vapor sampling if they will be conducting exposure monitoring as outlined in paragraph 2.03.8.a, Exposure Assessment.
- Shall consult with the region's IH on tasks involving lead work and any required exposure monitoring outlined in paragraph 2.03.8.a.
- Shall coordinate or conduct annual refresher training per paragraph 2.03.4.
- Shall coordinate with the first-line supervisor to provide affected employees and designated representatives with the proper personal protective equipment (PPE) to observe monitoring as outlined in paragraph 2.03.8.a.(1), Observation of Monitoring.

e. First-Line Supervisors

- Shall ensure employees performing lead work, or have potential exposure to lead, are trained per paragraph 2.03.4.
- Shall attend training at the same level as their employees performing lead work.
- Shall coordinate required medical examinations for employees performing lead work activities as outlined in paragraphs 2.03.8.d, Medical Surveillance and 2.03.8.e, Biological Monitoring.
- Shall verify employees are medically cleared, trained, and fit tested on the type of respiratory protection used when performing lead work.

- Shall notify the CP of all work with potential for lead exposure which may exceed the PEL or AL at least two weeks prior to lead work activities.
- Shall ensure engineering controls are working properly for lead work activities.
- Shall ensure that employees have the proper work clothing and required PPE for job tasks with the potential for lead exposure.

f. Employees with Potential for Lead Exposure

- Shall attend the training outlined in paragraph 2.03.4, annually and follow the requirements outlined in the LECP.
- Shall review the Job Hazard Analysis (JHA) and lead work plan prior to conducting job tasks with the potential for lead exposure and follow the identified precautions and PPE requirements.
- Shall not eat or drink in areas with the potential for lead exposure.
- Shall follow proper disposal procedures for contaminated protective clothing at the completion of the work shift.
- Shall complete any medical and periodic examinations as required by paragraph 2.03.8.d.
- Shall follow the elements in RSHS Section 2.08 if the employee is using a respirator.

g. Human Resources

- Shall maintain medical clearance documentation and provide the CP with clearance results of employees participating in the LECP.

4. Training Requirements

a. Employees with Potential for Lead Exposure

Employees working where there is a potential exposure to airborne lead, at or above the AL, shall receive training covering the following topics:

- content of 29 CFR 1926.62, Lead, and this section,
- specific job tasks which may result in exposures above the AL,
- results of initial lead monitoring and similar exposed groups,
- proper selection, fitting, use, and limitations of respiratory protection,
- description of the medical surveillance program,
- the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead,
- ways in which lead enters the body,
- reporting signs and symptoms of health problems,
- central nervous system, kidney, and blood effects,
- acute and chronic effects of overexposure to lead,

- the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant,
- why employees should not routinely use chelating agents to remove lead from employees' bodies and why they will only be used under the direction of a licensed physician,
- protective work clothing, equipment, hygiene practices, and housekeeping,
- engineering controls and safe work practices associated with the employee's job assignment,
- site/facility's LECP, and
- employee's right of access to records under 29 CFR 1910.1020, Access to Employee Exposure and Medical Records.

b. Refresher

Training outlined in paragraph 2.03.4.a, Employees with Potential for Lead Exposure, shall be conducted or coordinated by the CP annually.

c. Proficiency Qualification

Retraining is necessary when the CP or an employee demonstrates a lack of knowledge of lead work practices, the program elements of this section, or if there are changes to the program which could affect work practices or procedures.

d. Recordkeeping

The Department of the Interior shall keep all Reclamation training records in the official repository.

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment

The CP shall coordinate an initial employee exposure assessment, outlined in paragraph 2.03.8.a, for lead work activities determining if any employee(s) may be exposed to lead at or above the AL (e.g., exposure which would occur if the employee was not wearing respiratory protection).

b. Safety Measures

- Hygiene. Tobacco, cosmetic products, food, and beverages are forbidden in areas where employees are exposed to lead at or above the PEL (without regard to respirator use).
- Change Areas. The site/facility shall provide a change area to employees exposed to lead at or above the PEL. The site/facility shall equip the change area with separate storage facilities for protective work clothing, equipment, and street clothes to prevent cross-contamination.

- Showers. The site/facility shall provide showers, towels, and cleansing agents to employees who are exposed at or above the PEL.
- Eating Facilities/Areas. The site/facility shall provide employees exposed at or above the PEL with eating facilities/areas readily accessible and as free as from lead contamination as practicable. Employees shall not wear protective clothing inside eating facilities/areas.
- Hand Washing Facilities. The site/facility shall provide hand washing facilities for employees who are potentially exposed to lead.
- Precautions to Reduce or Eliminate Lead Exposures. Reclamation employees shall take additional precautions to eliminate lead exposures:

    - wear the required PPE,
    - always wash hands and face before eating, drinking, applying cosmetics, using tobacco products, or using the restroom,
    - avoid hand-to-face contact and nail biting in work areas where lead is present,
    - maintain work surfaces free from accumulations of lead-containing materials as practicable,
    - never sweep or use compressed air to clean up spills, clothing, or surfaces where lead dust may be present (i.e., wiping/mopping are acceptable cleaning methods),
    - use a vacuum equipped with a High Efficiency Particulate Air (HEPA) filter to clean work surfaces which may contain lead materials,
    - remove contaminated clothing and place in the properly labeled container, and
    - attend lead safety training annually, reviewing hazards and precautions necessary for minimizing lead exposures.

6. Pre-job Briefing and Planning Requirements

JHA. All lead work activities shall have a written JHA that includes a lead work plan reflecting the protective safety and health expectations and control measures associated with the applicable operations prior to initiating lead work activities. The CP, in coordination with the first-line supervisor, shall review JHAs involving lead tasks and consult with their IH to perform any required exposure assessments.

7. Personal Protective Equipment (PPE)

a. Respiratory Protection

Employees shall use respirators and adhere to the requirements in RSHS Section 2.08 An employee shall use a respirator when:

- exposure to lead exceeds the AL,
- engineering and work practice controls are not adequate to reduce exposures below the AL, and

- when interim protection measures are in place during an exposure assessment.

b. Protective Clothing

First-line supervisor shall provide work clothing that prevents contamination of personal clothing to employees performing lead work activities exposed at or above the AL, without regard to respirator use. Examples include coveralls, full-body clothing, gloves, face shields, goggles, or any other items deemed necessary for the job tasks. All protective clothing shall be repaired or replaced to maintain effectiveness.

- Laundering of Contaminated Clothing. The site/facility shall provide cleaning/laundering/disposal for protective clothing. The site/facility will launder contaminated protective clothing weekly, or daily if lead levels are above 200 µg/m³ as an eight-hour TWA, without regard to respiratory use. The site/facility shall inform the cleaning/laundering service that the protective clothing contains lead and inform them in writing of the potential harmful effects from lead exposure.
- Containers for Contaminated Clothing. Employees shall not shake or blow off contaminated clothing or perform any other method which may disperse lead dust into the air prior to placing the contaminated clothing in the container for cleaning, laundering, or disposal. The following label shall be adhered to all containers of lead contaminated clothing:

FIGURE 2.03-1 Containers for Contaminated Clothing Label

DANGER
CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM. DO NOT EAT, DRINK, OR SMOKE WHEN HANDLING. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE FEDERAL AND LOCAL REGULATIONS.

8. Safe Practices

a. Exposure Assessment

The CP shall conduct or coordinate personal exposure monitoring with the IH for employees performing work activities with the potential for lead exposure. Air monitoring shall accurately represent the employee's regular daily exposure to determine if it is at or above the AL. Representative, full-shift sampling shall include one sample for each job classification/shift or during the shift with the highest potential for exposure.

- Observation of Monitoring. Affected employees, or designated representatives, shall have the opportunity to observe any monitoring conducted on employees for potential lead exposure. The CP, in coordination with the first-line supervisor, shall provide the

required equipment to observers entering an area where respirators and protective clothing or equipment are required. Observers must meet the regulatory requirements for use of required equipment and not interfere with the monitoring. An explanation of the monitoring procedures and measurements, and the CP will provide a copy of the laboratory results to the affected employee(s) and representative(s).

- Job Tasks Considered Above the PEL. If the CP or IH has not performed an employee exposure assessment for the following lead-related tasks, then employee shall be considered exposed above, but not more than 10 times, the PEL and protective measures shall be implemented:

  - manual demolition of structures (e.g., dry wall), manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems, where lead-containing coatings or paint are present, and
  - spray painting with lead paint.

- Job Task Considered Exposure Above 500 µg/m³. If the CP or IH has not performed an employee exposure assessment for the following lead related tasks, the employee is considered exposed above 500 µg/m³ and protective measures shall be implemented:

  - using lead-containing mortar,
  - lead burning,
  - work activities where lead-containing coatings or paint are present,
  - rivet busting,
  - power tool cleaning without dust collection systems,
  - cleanup activities using dry expendable abrasives, and
  - abrasive blasting enclosure movement and removal.

  If previous results indicate the employee is exposed to levels of lead below 500 µg/m³, the first-line supervisor may provide the employee with the appropriate respirator for use at lower exposures.

- Job Tasks Considered Exposure Above 2500 µg/m³. If the CP or IH has not performed an employee exposure assessment for the following lead related tasks, the employee is considered exposed above 2500 µg/m³ and employee protective measures shall be implemented:

  - abrasive blasting,
  - welding,
  - cutting, and
  - torch burning.

If previous results indicate the employee is exposed to levels of lead below 2500 µg/m³, the first-line supervisor may provide the employee with the appropriate respirator for use at lower exposures.

- Basis of Initial Determination
    - Initial Determination. Employee exposure monitoring shall be based on employee monitoring results and the following:
        - observations or calculations which indicate employee exposure to lead,
        - any previous measurements of airborne lead, and/or
        - any employee complaints of symptoms attributed to lead exposure.
    - Monitoring Results Satisfying Initial Determination. When monitoring for lead exposure has been done within the past 12 months and was conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions, then those monitoring results may be used.
    - Subsequent Monitoring. If the initial determination, or subsequent monitoring, reveals an employee exposure at or above the AL, but below the PEL, the CP or the IH must repeat monitoring at least every six months. Monitoring shall continue until at least two consecutive measurements, taken at least seven days apart, are below the AL at which time the site/facility may discontinue monitoring.
    - Objective Data. When objective data demonstrates a product or material containing lead, or a specific process, operation, or activity involving lead cannot result in employee exposure at or above the AL during processing, use, or handling, then the data is acceptable in place of initial monitoring.
    - Objective Data Documentation. The CP or the IH shall document objective data. Reclamation must maintain objective data for at least 30 years, and be available to affected employees, former employees, and designated representatives.

- Negative Determination. The CP or the IH shall provide written documentation when initially monitoring and determining the employee is not exposed to airborne concentrations of lead at or above the AL. The record shall include the information in paragraph 2.03.8.a.6.a, Initial Determination, the date of determination, location within the worksite, and the name of each employee monitored. No further exposure monitoring is required unless:
    - there has been a change of equipment, process, controls, employees, or
    - a new task may result in additional employee exposure at or above the AL, or
    - a new task may result in employees who are already exposed at or above the AL potentially being exposed over the PEL.

- Employee Notification of Monitoring Results. The first-line supervisor in coordination with the CP and/or IH shall notify affected employees, in writing, of monitoring results within five business days.
- Employee Monitoring Results at or Above the PEL. When employee monitoring results are at or above the PEL, without regard to respiratory protection, the written notification shall include control measures and corrective actions to reduce the exposure below the PEL.
- Methods of Compliance. The CP and/or first-line supervisor shall ensure that engineering, work practice controls, and administrative controls are used to reduce and maintain employee exposure to lead at or below the PEL. If the controls do not reduce exposure levels below the PEL, they shall be used to reduce employee exposure to the lowest feasible level and supplemented with respiratory protection.

    - Mechanical Ventilation. The site/facility shall perform duct and capture velocity and static pressure measurements at least every three months when used to control lead exposures and within five days of any changes to job task(s) which may alter the employee's exposure to lead.
    - Recirculated Exhaust Ventilation. The site/facility shall use a high-efficiency filter with a back-up filter when air is recirculated from a lead job task. The system shall have controls to monitor the concentration of lead in the return air and means to bypass the recirculation system automatically if it fails.
    - Administrative Controls. The first-line supervisor shall implement a job rotation schedule to reduce an employee's lead exposure which includes:

        - employee's name or identification,
        - duration and employee's exposure levels for each job task, and
        - any other information validating the administrative control.

b. Lead Work Plan

First-line supervisor, in coordination with the CP and/or the IH shall develop and implement a work plan for each job task with the potential for lead exposure at or above the PEL. The work plan shall be part of the JHA and address the following elements:

- detailed description of each work activity with the potential for lead exposure including equipment used, employee job responsibilities, and operating and maintenance practices,
- description of the specific means used to achieve compliance, where engineering controls are required, and engineering plans and studies used to determine methods selected for controlling exposure to lead,
- report of the technology considered in meeting the PEL,
- air monitoring data which identifies the potential source of lead exposure,
- engineering controls including the selection method to reduce exposures below the PEL,

- work practice and administrative controls including a job rotation schedule identifying the affected employee and the time and exposure level at each task,
- decontamination procedures for protective clothing,
- hygiene facilities, practices, and change areas,
- required PPE,
- work area clean-up procedures including HEPA vacuuming and wet wiping, and
- procedure for the final inspection of lead dust/debris by the CP.

c. Exposure Monitoring Records

Reclamation shall keep all monitoring and other data used in conducting employee exposure assessments in accordance with 29 CFR 1910.1020 and contain the following information:

- date(s), number, duration, location, and results of each of the samples taken including a description of the sampling procedure used to determine representative employee exposure,
- description of the sampling and analytical methods used and evidence of accuracy,
- type of respiratory protective devices worn,
- name and job classification of the employee monitored and names of all other measurement-representing employees, and
- any environmental variables affecting the measurement of employee exposure.

d. Medical Surveillance

- Employees Exposed at or Above the AL for Any One Day. The first-line supervisor in coordination with the CP and/or IH will make initial medical surveillance available to employees occupationally exposed on any one day to lead at or above the AL.
- Employees Exposure at or Above the AL for 30 Days. The first-line supervisor in coordination with the CP and/or IH will implement a medical surveillance program consisting of blood lead and zinc protoporphyrin (ZPP) for employees who are or may be occupationally exposed at or above the AL for more than 30 days in any consecutive 12 months.

e. Biological Monitoring

- Blood Lead and ZPP Level Sampling and Analysis. Employees covered in paragraph 2.03.8.d shall have a physician or other licensed health care professional (PLHCP) conduct biological monitoring in the form of blood sampling and analysis for lead and ZPP. This shall occur every two months for the first six months and then every six months afterwards.
- Blood Lead Level (BLL) at or Above 40 µg/dl. The first-line supervisor will notify and place employees in temporary medical removal, with medical removal protection benefits, when a periodic and/or a follow-up blood sampling test indicates the employee's BLL is at or above 50 µg/dl. The employee will complete a follow-up test

within two weeks of the first blood test which indicated the employee's BLL was at or above 50 µg/dl.

- Medical Examinations and Consultations. The PLHCP will conduct medical examinations and consultations with the following frequency:

  - annually for each employee identified in paragraph 2.03.8.d., Employees Exposure at or Above the AL for 30 Days, with a blood lead test indicating a BLL at or above 40 µg/dl during the preceding 12 months,
  - as soon as possible when an employee develops signs or symptoms associated with lead intoxication,
  - when the employee is pregnant, wants medical advice on the effects of past or current exposures to lead, or wants information on the ability to procreate a healthy child after past or current exposure to lead,
  - has demonstrated difficulty in breathing during a respirator fit test or during respirator use, and/or
  - as medically appropriate for each employee either removed from exposure to lead due to a risk of impairment to health, or otherwise limited pursuant to a final medical determination.

- Medical Examination Elements. Annual medical examinations required in paragraph 2.03.8.e., Medical Examinations and Consultations, shall include the following elements:

  - detailed work and medical history, with attention to past lead exposure (i.e., occupational and non-occupational), personal habits (e.g., smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive, and neurological problems,
  - thorough physical examination, with attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems (a PLHCP must evaluate the employee's pulmonary system if respiratory protection will be used),
  - blood pressure measurement,
  - blood sample determining BLL, hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology, ZPP, blood urea, and nitrogen serum creatinine, and
  - urinalysis with microscopic examination and any other testing the physician deems necessary.

- Medical Examination and Procedures. A PLHCP shall conduct all medical examinations and procedures at no cost to the employee, including multiple

physician reviews. The CP or first-line supervisor shall provide the employee their results, in writing, within five business days.

- Information for the Physician. The CP or fist-line supervisor shall provide the following information to the physician performing the medical examination:

  - copy of 29 CFR 1926.62 and 29 CFR 1910.1025,
  - description of the affected employee's duties,
  - the employee's determined or anticipated exposure level to lead or other toxic substances,
  - description of required PPE,
  - prior blood lead determinations, and
  - prior medical opinions.

- Information Provided to the Employee. The employee shall receive a written copy of the medical opinion from each physician which contains only the following information:

  - physician's opinion if a medical condition would place the employee at increased risk of material impairment from exposure to lead,
  - recommended special protective measures or limitations for the employee,
  - recommended limitation of employee's respirator use, including whether the employee can wear a powered air- purifying respirator if a physician determines the employee cannot wear a negative pressure respirator, and
  - results of the BLL determinations.

- Multiple Physician Review. Employees may designate a second physician to review the results, findings, determinations, or recommendations, and to conduct additional lab tests deems necessary. The employee must make an appointment requesting a second medical opinion within 15 days after receiving the notification or the initial physician's written opinion, whichever is later.

  - Differing Medical Opinions. If two physicians' opinions differ, the site/facility and employee must resolve the disagreement. If not resolved, the site/facility and employee must designate a third physician to review the findings, conduct an examination, consultation, and lab tests or discuss with the previous physicians to resolve the disagreement.
  - Resolution of Differing Medical Opinions. The site/facility shall use the findings, determinations, and recommendations of the third physician, unless an agreement is made with the employee which is consistent with the recommendations of at least one of the three physicians.

f. Medical Removal Protection

- Temporary Medical Removal Due to Elevated BLL. The first-line supervisor shall remove any employee exposed to lead at or above the AL or has a periodic/follow-up blood test indicate a BLL at or above 50 µg/dl from work.
- Temporary Removal Due to Final Medical Determination. The first-line supervisor shall remove any employee with a detected medical condition or an increased risk of health impairment from lead exposure at or above the AL. The first- line supervisor shall implement any recommended special protective measures or limitations to exposure.

    - Return to Work. Employees may return to work when two consecutive blood tests indicate the BLL is below 40 µg/dl.
    - Return to Work Due to Final Medical Determination. Employees may return to work when a subsequent final medical determination indicates limitations or special protective measures are no longer required.
    - Return to Work Exceptions. The employee may return to work, end any special protective measures, and remove any limitations excluding the following exceptions:

        - if the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician, and/or
        - if the employee has been on removal status for the preceding 18 months due to an elevated BLL.

    - Medical Removal Protection Benefits. The site/facility shall provide employees up to 18 months of medical removal protection benefits for each removal from lead exposure.
    - Follow-up Medical Surveillance. During employee removal, or required limitations, the site/facility may require the employee to participate in follow-up medical surveillance to receive medical removal protection benefits.
    - Medical Removal Surveillance Documentation. For each employee removed, the site/facility shall maintain a record for the duration of employment including:

        - name, dates each time the employee was removed, and date the employee returned to work, and
        - information on how the removal was accomplished and if it was the result of an elevated BLL.

9. Communication Requirements

a. Hazard Communication

The site/facility shall cover lead in the hazard communication program to include container labeling, safety data sheets, and training outlined in RSHS Section 1.19.

b. Signs

The site/facility shall post readily visible signs in each area where exposure is above the PEL:

FIGURE 2.03-2: Exposure Above PEL Signage

DANGER LEAD WORK AREA **MAY DAMAGE FERTILITY OR THE UNBORN CHILD CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM DO NOT EAT, DRINK, OR SMOKE IN THIS AREA**

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.04 Heat and Cold Stress

1. Scope

This section applies to Bureau of Reclamation facilities to protect employees performing indoor and outdoor work in temperatures that have the potential for heat and/or cold-related illnesses.

2. General Requirements

Reclamation's goal is to eliminate or reduce adverse health effects from exposure to high heat and cold temperatures through engineering, work practice controls, employee training, acclimatization, measurements, job task assessments of heat and/or cold stress, the proper use of heat-protective clothing, and personal protective equipment (PPE).

3. Responsibilities

a. Area Office Managers

- Shall provide the necessary resources to implement and maintain the procedures within this section.

b. First-Line Supervisors

- Shall ensure employees receive training according to paragraph 2.04.4, Training, where there is reasonable likelihood of exposures that could cause heat and/or cold stress.
- Shall coordinate with the safety manager/safety specialist, and the regional/local industrial hygienist (IH) to perform workplace assessments, training, and exposure monitoring as necessary.
- Shall provide employees performing job tasks in temperatures that can cause heat and/or cold stress with the appropriate controls, equipment, and PPE.
- Shall make adequate water and shade available at work locations where environmental risk factors for heat illness are present.
- Shall coordinate with the safety manager/safety specialist, and the regional/local IH, to ensure employees working in environments, that have the potential for cold stress, have access to heated areas that will not expose them to harmful carbon monoxide levels.
- Shall acclimatize employees performing job tasks in temperatures that can cause heat and/or cold stress.

c. Employees

- Shall complete the training requirements, as assigned by their first-line supervisor, in paragraph 2.04.4 of this section.
- Shall review the job hazard analysis (JHA) and the identified precautions and controls before conducting work in temperatures that can cause heat and/or cold stress.

- Shall immediately report any heat or cold related illness symptoms they or their coworkers are experiencing to their supervisor.
- Shall immediately report any heat or cold related illness symptoms they or their coworkers are experiencing to their supervisor.

d. Regional Safety Managers

- Shall provide local safety professionals assistance in developing heat and cold stress procedures, as requested.

e. Regional and Local Industrial Hygienists

- Shall provide technical assistance such as workplace hazard assessments for heat and/or cold stress, exposure monitoring, and training.

f. Safety Managers/Safety Specialists

- Shall coordinate heat and cold stress training covering the elements in paragraph 2.04.4 of this section.
- Shall assist first-line supervisors in identifying and implementing safety measures for heat and cold stress program elements outlined in this section.

g. Human Resources Officers (HRO)

- Shall maintain received medical examination results, clearance documentation, and employee exposure monitoring records in the employee's medical folder according to 29 CFR 1910.1020(d)(1), Access to Employee Exposure and Medical Records, the Privacy Act of 1974 (P.L. 93-579), and provide the regional/local IH and/or first-line supervisor with the clearance results as requested.

4. Training

a. Heat Stress

First-line supervisors shall work with the safety manager/safety specialist, and the regional/local IH, to coordinate employee training before exposure to work environments that may cause heat stress and must cover, at a minimum, the following elements:

- recognition of the signs and symptoms of heat-related illnesses (e.g., heat stroke, heat exhaustion, heat cramps, heat rash, heat syncope, rhabdomyolysis) and administration of first aid,
- causes of heat-related illnesses and the procedures that will minimize the risk, (e.g., drinking enough water and monitoring the color and amount of urine output),
- proper care and use of heat-protective clothing and equipment,
- added heat load caused by exertion, clothing, and PPE,
- effects of nonoccupational factors (e.g., drugs, alcohol, obesity, etc.) on tolerance to occupational heat stress,

- the importance of acclimatization,
- the importance of immediately reporting to the supervisor any symptoms or signs of heat-related illness in themselves or in coworkers, and
- procedures for responding to symptoms of possible heat-related illness and for contacting emergency medical services and the importance of using the buddy system.

In addition to the elements in paragraph 2.04.4.a, Heat Stress, the first-line supervisor shall be trained on the following minimum elements:

- how to implement appropriate acclimatization procedures,
- procedures to follow when a worker has symptoms consistent with heat- related illness, including emergency response procedures,
- how to monitor weather reports,
- how to respond to hot weather advisories, and
- how to monitor and encourage adequate fluid intake and rest breaks.

b. Cold Stress

First-line supervisors shall work with the safety manager/safety specialist and the regional/local IH to coordinate employee training before exposure to environments that may cause cold stress. The training must cover, at a minimum, the following elements:

- how to recognize the environmental and workplace conditions that can lead to cold stress,
- how to recognize the signs and symptoms of the types of cold stress (e.g., chilblains, immersion/trench foot, frostbite, and hypothermia),
- the importance of immediately reporting to the supervisor any symptoms or signs of cold stress in themselves or in coworkers,
- how to prevent cold stress and administer basic first aid,
- how to select proper clothing for cold, wet, and windy conditions,
- how wind chill affects outdoor temperature, and
- the importance of using the buddy system.

In addition to the elements in paragraph 2.04.4.b, Cold Stress, the first-line supervisor shall be trained on the following minimum elements:

- what procedures to follow when a worker has symptoms consistent with cold-related illness, including emergency response procedures,
- how to monitor weather reports for wind chill,
- how to create a work/rest schedule, and
- how to use work scheduling or alternate work schedules to avoid employee exposure to the hottest parts of the day.

c. Lack of Proficiency

Retraining is necessary when an employee performing work with the potential for heat and/or cold stress symptoms demonstrates a lack of knowledge of work practices or the program elements in this section.

d. Recordkeeping

All training records shall be kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, RCD 05-01, Information Management.

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment

The first-line supervisor, in coordination with the safety manager/specialist and the regional/local IH, shall assess the workplace and review outdoor job tasks for potential heat and/or cold stress situations and determine the appropriate controls, equipment, and PPE to reduce employee exposures.

b. Safety Measures

- Hierarchy of Controls for Heat Stress. The first-line supervisor, in coordination with the safety manager/safety specialist, and/or regional/local IH, shall implement the appropriate heat stress controls below to reduce employee exposure while performing work activities with heat stress potential:

    - increase air velocity,
    - use reflective or heat-absorbing shielding or barriers if feasible,
    - limit time in the heat and/or increase recovery time spent in a cool environment,
    - schedule job tasks or alternate work schedules to avoid employee exposure to the hottest parts of the day,
    - use appropriate tools to minimize manual strain,
    - increase the number of workers per task and implement a buddy system,
    - require self-monitoring and provide adequate amounts of cool, potable water near the work area, and
    - institute a heat acclimatization plan.

- Hierarchy of Controls for Cold Stress. The first-line supervisor, in coordination with the safety manager/specialist and/or regional/local IH, shall implement the appropriate cold stress controls below to reduce employee exposure while performing work activities with cold stress potential:

    - determine if the job task can be moved indoors,
    - use radiant heat to warm the work area or provide a warm area for breaks,

- shield the work area from wind,
- insulate equipment handles,
- schedule work during the warmest part of the day,
- ensure employees stay hydrated,
- ensure employees stay dry to avoid hypothermia and trench foot,
- schedule frequent breaks in warm areas,
- wear several layers of loose clothing for better insulation (inner layers should be wool or moisture wicking fabrics, outer layers should be wind and water-resistant),
- wear proper clothing (e.g., wool and synthetics, not cotton),
- using a personal flotation device (e.g., PFD, life vest, immersion suit, dry suit),
- have a means of both signaling rescuers (e.g., strobe lights, personal locator beacon, whistles, flares, waterproof radio) and having a means of being retrieved from the water to increase water immersion survival times,
- train supervisors and managers to recognize and react to symptoms of chilblains, frostbite, hypothermia, and trench foot,
- use the buddy system to monitor each other for symptoms of cold stress,
- train supervisors, managers, and employees on how to use the National Oceanic Atmospheric Administration's (NOAA) wind chill chart, and
- provide cold weather PPE.

6. Pre-job Briefing and Planning Requirements

a. JHA

The first-line supervisor, in coordination with the safety manager/specialist, shall ensure that the procedures for providing first-aid and where to get medical care are included in JHAs when heat or cold stress has been identified as a real or potential risk factor.

b. Protective Clothing

The first-line supervisor shall ensure employees performing indoor and outdoor work in temperatures that have the potential for heat and/or cold related injuries/illnesses use the appropriate PPE.

- PPE Worn in Hot Work Environments. The first-line supervisor, in coordination with the safety manager/specialist and/or the regional/local IH, shall determine the appropriate PPE to use in hot work environments and ensure it provides adequate protection with the lowest estimated increase to the employee's core temperature. If the type of PPE worn may increase the employee's core temperature, then first-line supervisors must implement work/rest cycles considering the following elements:

  - type of PPE,
  - length of time the employee wears PPE,
  - employee's fitness level, hydration level, and acclimatization, and

- environmental conditions (e.g., heat, humidity, radiant heat from the sun, wind speed).

- Rest Breaks. The first-line supervisor shall implement the following elements during rest breaks to reduce the employee's core temperature:

  - take off any removable PPE,
  - ensure employees are rehydrating, and
  - ensure there is a cool environment (e.g., air-conditioned room, vehicle, or shaded area) for employees to rest in.

- PPE Worn in Cold Work Environments. The first-line supervisor, in coordination with the safety manager/specialist and/or regional/local IH, should consider the follow when selecting PPE to use in cold work environments:

  - at least three layers of loose-fitting clothing for better insulation (i.e., an inner thermal layer, a middle of wool or moisture wicking material, and an outer wind and rain protection layer),
  - face covering for protecting the face and mouth,
  - head, face, and neck coverings,
  - cold weather gloves,
  - waterproof, insulated boots, and
  - reflective gear for employee visibility during shortened daylight hours.

7. Safe Practices

a. Heat Acclimatization

The first-line supervisor, in coordination with the safety manager/safety specialist, shall ensure employees gradually increase the intensity of work performed in a hot environment by gradually increasing work time in hot conditions over a period of 7 to 14 days and from cooling off and fully rehydrating between shifts.

- Acclimatization Plan for Employees Working in the Heat. First-line supervisors shall create an acclimatization work plan that addresses the following elements below recommended by the National Institute of Safety and Occupational Health (NIOSH):

  - first-line supervisors should not expose new employees to hot conditions for more than 20 percent of the workday the first day and an additional 20 percent exposure each day thereafter, and
  - employees with previous experience for the same job should expect 50 percent heat exposure on the first day, 60 percent the 2nd day, 80 percent the 3rd day, and 100 percent the 4th day.

b. Hydration for Employees Working in the Heat

The first-line supervisor shall ensure employees have access to cool potable drinking water near their work area(s) and encourage them to drink an adequate quantity to remain sufficiently hydrated.

c. Access to Shade for Employees Working in the Heat

First-line supervisors shall ensure employees have access to shade that is open to the air or provided with ventilation or cooling. Alternative measures (e.g., misting machines) may be used if they are feasible and as effective as shade to cool employees.

d. Monitoring for Heat Stress

As necessary, the first-line supervisor, in coordination with the regional/local IH and/or safety manager/specialist, shall assess employee exposures to environmental heat. Use of a device capable of assessing the Wet Bulb Globe Temperature (WBGT) is recommended. If a WBGT monitor is not available, then the OSHA-NIOSH Heat Safety Tool app can provide recommendations to prevent heat-related illnesses.

e. Cold Acclimatization

The first-line supervisor shall work in coordination with the safety manager/specialist and the regional/local IH, to develop a work/rest plan for job tasks in cold environments. The acclimatize plan shall cover new workers, and those returning after time away from work, by gradually increasing their workload and allowing more frequent breaks in warm areas, as they build up a tolerance for working in the cold environment.

- Monitoring for Cold Stress Using the Wind Chill Guide. First-line supervisors should use the NOAA windchill temperature chart when planning job tasks in cold environments and assess employee exposures to environmental cold.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.05 Ionizing and Nonionizing Radiation

1. Scope

This section applies to Bureau of Reclamation facilities to protect employees from potential exposure to ionizing and nonionizing radiation while performing their job tasks.

2. General Requirements

a. Ionizing and Nonionizing Radiation Levels

Reclamation's goal is to maintain employee exposures as low as reasonably achievable (ALARA) and at no time shall ionizing/nonionizing radiation levels exceed limits set by Federal Occupational Safety and Health (OSHA) 29 CFR 1910.1096, Ionizing Radiation, 29 CFR 1910.97, Nonionizing Radiation. At no time shall anyone under 18 years perform work in or around ionizing radiation.

b. Nuclear Regulatory Commission Licensed Device Requirements

Reclamation facilities using a Nuclear Regulatory Commission (NRC) licensed device must meet the specific requirements of their device(s) outlined in 10 CFR part 20, Standards for Protection Against Radiation, Subparts A-O, and Part 31, General Domestic Licenses for Byproduct Material. Reclamation facilities that possess or use source material, byproduct material, or special nuclear material, as defined in the Atomic Energy Act of 1954, under a license issued by the NRC and in accordance with the requirements of 10 CFR part 20, shall be considered in compliance with the requirements of 29 CFR 1910.1096 with respect to possession and use.

3. Responsibilities

a. Area Office Managers

- Shall provide the necessary resources to implement and maintain the procedures within this section.
- Shall select a radiation safety officer (RSO) that meets the training and experience requirements for their generally licensed device(s).

b. First-Line Supervisors

- Shall ensure employees receive training according to paragraph 2.05.4, Radiation Safety Training, where there is reasonable likelihood of exposures to ionizing/nonionizing radiation (e.g., laser surveying equipment and microwave communication tower work).
- Shall coordinate with the regional/local industrial hygienist (IH), safety manager/safety specialist, and RSO to perform workplace assessments, training, job hazard analysis, and exposure monitoring as necessary and remove hazards whenever possible using the hierarchy of controls listed in RSHS Section 1.07.2, Personal Protective Equipment.

- Shall coordinate with the regional/local IH and the safety manager/safety specialist to ensure employees performing job tasks with the potential for exposure to ionizing/nonionizing radiation with the appropriate controls, equipment, and personal protective equipment (PPE).
- Shall immediately notify all ionizing/nonionizing radiation exposures to the RSO and/or safety manager/safety specialist as appropriate.
- Shall coordinate with the RSO to ensure that the ionizing/nonionizing radiation exposure to an embryo/fetus carried by a pregnant employee exposed to radiation, that has voluntarily declared their pregnancy, does not exceed 0.5 rem during their entire pregnancy.

c. Employees

- Shall complete radiation protection training requirements in paragraph 2.05.4, Radiation Safety Training.
- Shall review the job hazard analysis (JHA) and the identified precautions and controls before conducting job tasks that use ionizing/nonionizing radiation equipment.
- Shall report ionizing/nonionizing radiation exposure incidents and releases to the first-line supervisor immediately.
- Shall wear personal monitoring devices where required.
- Shall follow the voluntary facility reporting procedure, for pregnant employees exposed to radiation, to ensure the RSO, local safety specialist/manager, and first-line supervisor have been notified.

d. Regional Safety Managers

- Shall provide support in developing a radiation safety program, as requested.

e. Regional/Local Industrial Hygienists and Safety Managers/Safety Specialists

- Shall provide technical assistance such as workplace hazard assessments, exposure monitoring, and training.
- Shall develop and implement a local radiation safety program covering ionizing radiation equipment, that does not require an NRC license, and for nonionizing radiation equipment used at their facility.
- Shall have a basic understanding for operating ionizing/nonionizing radiation equipment used at their facility.
- Shall provide technical assistance such as workplace hazard assessments, exposure monitoring, and training.

f. Radiation Safety Officer

- Shall oversee the NRC broad scope or specific licenses issued to their facility's equipment and implement the license requirements in accordance with NRC regulations.

- Shall provide technical oversight, support, and training for NRC licensed devices. Shall attend RSO training at intervals according to their licensed device requirements.
- Shall develop and implement a radiation safety program that includes operations using regulated licensed devices at their facility.
- Shall review the radiation safety program at least annually.
- Shall complete annual leak testing for radioactive sources, if required by their license, and ensure an approved laboratory analyzes the results.
- Shall conduct self-audits to ensure licensed device(s) are in compliance with Federal regulations.
- Shall make appropriate notification and reporting of radiation incidences and overexposures to the appropriate governing authority.
- Shall confirm that all authorized users, as defined in the license or permit of licensed equipment, are actively monitored for radiation exposure and accurately maintain exposure records.
- Shall confirm that all authorized users, as defined in the license or permit of licensed equipment, are actively monitored for radiation exposure and accurately maintain exposure records.
- Shall ensure transported licensed material complies with all applicable Department of Transportation requirements.
- Shall ship all licensed material using a commercial carrier according to 49 CFR, Transportation, parts 171-177.

g. Human Resources Officers (HROs)

- Shall maintain all medical examination results, clearance documentation, and employee exposure monitoring records in the employee's medical folder according to 29 CFR 1910.1020(d)(1), Access to Employee Exposure and Medical Records, the Privacy Act of 1974 (P.L. 93-579), and provide the RSO, regional/local IH, first-line supervisor, and safety manager/safety specialist supervisor with clearance results as requested.

4. Radiation Safety Training

a. Ionizing Radiation Training for Licensed Devices Elements

The RSO shall conduct and/or coordinate training for employees prior to using licensed devices, entering areas where radiation generating devices are used, or where there is a potential for an individual to receive a total effective dose equivalent of 100 mrem or more in 1 year covering the following minimum elements:

- type of radioactive material and/or the device used,
- NRC license conditions and requirements for use of equipment,

- health and safety concerns associated with radiation and the potential effects of radiation on a pregnant female, the embryo/fetus, voluntary reporting procedure for declared pregnant employees,
- contents of the facility's radiation safety program,
- precautions and ALARA controls used to control radiation exposure,
- allowable radiation dose limits,
- types of equipment used for radiation monitoring and surveying,
- types of personal monitoring devices required,
- appropriate PPE used for shielding (e.g., lead apron, gloves, safety goggles, respirators for airborne radionuclides, etc.),
- review of caution signs, labels, and warning signals,
- notification requirements for radiation incidents,
- spill and contamination control of radioactive material, if appropriate for the facility,
- radioactive waste disposal procedure if applicable for the facility, and
- employee rights and responsibilities.

The safety manager/safety specialist, first-line supervisor, and/or the regional/local IH, shall coordinate training for non-licensed devices or equipment used at their facility, covering the appropriate elements in paragraph 2.05.4.a, Ionized Safety Training for Licensed Devices Elements.

b. Nonionizing Radiation Training Elements

The safety manager/safety specialist, the first-line supervisor, and/or the regional/local IH, shall coordinate employee training covering the following minimum elements for the nonionizing devices/equipment used at their facility:

- electromagnetic radiation (e.g., microwave radiation for communications, radar, etc.) hazards,
- infrared radiation (e.g., furnaces, heat lamps, infrared lasers) hazards,
- ultraviolet radiation (e.g., welding arcs, ultraviolet lasers, black lights) hazards,
- radiofrequency radiation (e.g., radio waves, low energy microwaves, visible light),
- manufacturer's procedures for use and maintenance of nonionizing radiation devices/equipment, and
- OSHA's radiation protection guidance for normal environmental conditions and for incident electromagnetic energy addressed in paragraph 2.05.8.c, Radiation Protection Guidance for Nonionizing Radiation.

c. Lack of Proficiency

Retraining is necessary when an employee demonstrates a lack of knowledge of ionizing/nonionizing work practices or elements of this section.

d. Recordkeeping

The RSO, safety manager/safety specialist, and first-line supervisors shall ensure training records are kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, RCD 05-01, Information Management.

5. Hazard Identification, Assessment, and Safety Measures

Hazard Identification and Assessment. Authorized users shall survey and document locations where employees use licensed devices and/or equipment on and off the facility. Authorized users will also ensure the appropriate controls, personal monitoring devices, PPE, and any other requirements of the license is available to reduce potential employee exposure to ionizing radiation. The survey may include, as appropriate, a physical survey of the location of materials and equipment and measurements of radiation levels or concentrations of radioactive material. The safety manager/safety specialist shall survey and document areas where nonionizing radiation hazards are present, used, released, or disposed from non-licensed devices.

6. Safety Measures

Radiation Safety Program for Ionizing/Nonionizing Devices/Equipment. The RSO, in coordination with the safety manager/safety specialist and radiation safety council, where present, shall develop and implement a radiation safety program covering the following minimum elements appropriate to the type of licensed/non-licensed equipment used at their facility:

- use of appropriate ALARA procedures to reduce potential exposures,
- a dosimetry program for personal exposure monitoring,
- surveys to document potential radiation exposure,
- radiological controls (e.g., entry/exit and inventory/storage/disposal controls),
- employee training,
- emergency procedures for responding to radiological situations,
- recordkeeping and reporting requirements, and
- annual internal audit procedures.

7. Pre-job Briefing and Planning Requirements

Job Hazard Analysis. The RSO, in coordination with the first-line supervisor and the safety manager/specialist, shall ensure JHAs include ALARA procedures and the appropriate PPE for reducing potential exposures to radiation devices/sources and nonionizing equipment when performing job tasks.

8. Safe Practices

a. As Low as Reasonably Achievable

RSOs and the safety managers/specialist shall develop ALARA procedures and/or work practices to minimize an employee's radiation exposure when working with or around radioactive materials using the following principles:

- reducing the amount of time spent near a radioactive source to reduce the dose,
- increasing distance from a radioactive source to decrease the dose, and
- using proper shielding for the radiation source to protect employees from potential exposure.

b. Radiation Exposure to Employees in Restricted Areas

Reclamation shall not possess, use, or transfer sources of ionizing radiation that may cause any individuals in a restricted area to receive, in any period of 1 calendar quarter, from a dose more than the limits specified below:

- 1.25 rems per calendar quarter whole body: head and trunk, active blood-forming organs, lens of eyes, or gonads,
- 18.75 rems per calendar quarter: hands and forearms, feet and ankles,
- 7.50 rems per calendar quarter: skin of whole body, and
- The dose to an embryo/fetus shall follow the guidelines in 10 CFR 20.1208, Dose Equivalent to an Embryo/Fetus.

Dose Monitoring. The RSO shall coordinate dose monitoring when an employee is likely to receive a dose in any calendar quarter more than 25 percent of the applicable occupational limit and for each employee who enters a high radiation area.

c. Radiation Protection Guidance for Nonionizing Radiation

For normal environmental conditions and for incident electromagnetic energy of frequencies from 10 MHz to 100 GHz, the radiation protection guide is 10 mW/cm² (milliwatt per square centimeter) as averaged over any possible 0.1-hour period (i.e., the guide applies whether the radiation is continuous or intermittent) as follows:

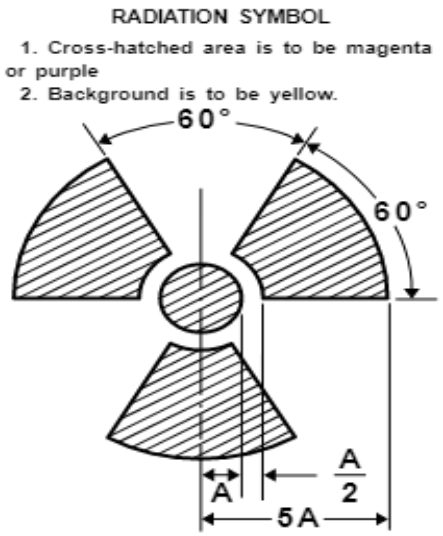
- power density: 10 mW/cm² for periods of 0.1-hour or more, and
- energy density: 1 mW-hr/cm² (milliwatt hour per square centimeter) during any 0.1- hour period.

This guide applies whether the radiation is continuous or intermittent.

d. Ionizing and Nonionizing Radiation Signs

- Caution Radiation Area. The RSO shall ensure that each radiation area has conspicuous signs posted with the radiation caution colors (black, magenta, or purple on a yellow background) and symbol (3-bladed fan) with the words: **CAUTION RADIATION AREA** where radiation exists at such levels that a major portion of the body could receive a dose more than 5 mrem per hour, or in any 5 consecutive days a dose more than 100 mrem.

FIGURE 2.05-1: Radiation Symbol

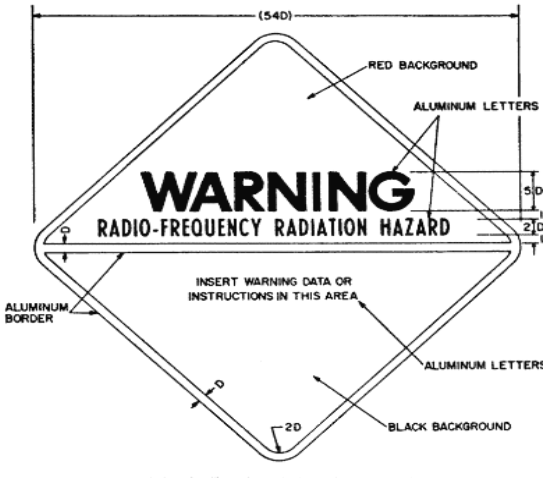


- Caution High Radiation Area. The RSO shall post conspicuous signs with the radiation caution colors and symbol with the words: **CAUTION HIGH RADIATION AREA**, where airborne radiation exists at such levels that a major portion of the body could receive a dose more than 100 mrem per hour.
- Caution Airborne Radioactivity Area. The RSO shall post conspicuous signs with the radiation caution colors and symbol with the words: **CAUTION AIRBORNE RADIOACTIVITY AREA**, for any room, enclosure, or operating area in which airborne radioactive materials, composed wholly or partly of radioactive material, exist in concentrations in excess of the amounts specified in column 1 of Table 1 of appendix B to 10 CFR part 20. The RSO shall also post conspicuous signs in any room, enclosure, or operating area in which airborne radioactive materials exist in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in column 1 of Table 1 of appendix B to 10 CFR part 20.
- Additional Radioactive Signage Requirements. The RSO shall post conspicuous signs with the radiation caution colors and symbol with the words: **CAUTION RADIOACTIVE MATERIALS** where airborne radioactive material is used or stored and which contains

any radioactive material (other than natural uranium or thorium) in any amount exceeding 10 times the quantity of such material specified in 10 CFR 20, appendix C, Quantities of Licensed Material Requiring Labeling, (1971 version). For natural uranium or thorium, this sign is required when the amount present exceeds 100 times the quantity of such material specified in 10 CFR 20 (as referenced in 29 CFR 1910.1096(e)(5)(ii)).

- Nonionizing Radiation Microwave. The RSO shall ensure that each nonionizing radiation area has conspicuous signs posted. The warning symbol for radio frequency radiation hazards shall consist of a red isosceles triangle above an inverted black isosceles triangle, separated and outlined by an aluminum color border. The words **WARNING—RADIO- FREQUENCY RADIATION HAZARD** shall appear in the upper triangle.

FIGURE 2.05-2: Radio Frequency Radiation Hazard Symbol



- Nonionizing Radiation Telecommunications. The RSO shall ensure that accessible areas associated with microwave communication systems where the electromagnetic radiation level exceeds the radiation protection guide given in §1910.97 are posted as described in that section. The warning symbol for telecommunications radio frequency radiation hazard shall consist of a red isosceles triangle above an inverted black isosceles triangle, separated and outlined by an aluminum color border. The words **WARNING—RADIO-FREQUENCY RADIATION HAZARD** shall appear in the upper triangle. The lower half of the warning symbol shall include the following: “Radiation in this area may exceed hazard limitations and special precautions are required. Obtain specific instruction before entering.”

e. Ionizing Warning Signal

The RSO should ensure the design of radiation-producing equipment or devices has an audible alarm, in locations employees are present, that is at least 75 decibels to warn that a radiation hazard exists indicating immediate and complete evacuation is essential. The signal shall be

unique to other alarms at the facility and initiated without requiring employee activation. The RSO shall coordinate periodic alarm tests, checks, and inspections to guard against malfunctions of the system.

f. Notification of Incidents

The RSO shall immediately notify the NRC operations center by phone for reportable incidents and local management (e.g., lost or stolen devices/equipment, damaged devices/equipment that cannot be brought back into the shielding, personal dosimetry results exceeding allowable dose limits) with licensed devices/equipment that meet the radiation doses in 10 CFR 20.2202, Notification of Incidents.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.06 Health Hazard Assessments

1. Scope

This section establishes guidelines for Bureau of Reclamation facilities conducting health hazard assessments, identifying hazardous materials and environments, identifying risk factors, analyzing, and evaluating the risks associated with the hazards, and providing controls to protect employees from potential exposures.

2. General Requirements

Reclamation's goal is to prevent employee occupational injuries and illnesses by anticipating, recognizing, evaluating, and controlling occupational health and safety hazards. Facility health hazard assessments shall be conducted to help:

- create awareness of hazards and risks,
- identify who may be at risk (e.g., employees, visitors, contractors, the public),
- identify the route of entry of hazardous materials to an employee, measure the dose, and evaluate toxicity to an employee over a specified time,
- confirm if existing control measures or newly implemented ones reduce or eliminate the hazard, and
- prioritize hazards and their control measures.

3. Responsibilities

a. Area Office Managers

- Shall provide the necessary resources to complete health hazard assessments and implement feasible control strategies to eliminate or reduce employee exposures.

b. First-Line Supervisors

- Shall ensure their employees receive training according to paragraph 2.06.4, Training, of this Reclamation Safety and Health Standard (RSHS) on the health hazard assessment process and ensure their participation.
- Shall coordinate with the regional/local industrial hygienist (IH) and the safety manager/ safety specialist to perform health hazard assessments, training, and exposure monitoring as necessary.
- Shall ensure that findings from health hazard assessments are reviewed with affected employees and incorporated into job hazard analyses (JHAs) as appropriate.
- Shall ensure engineering controls and mitigation techniques are utilized properly and functioning as intended in work areas.
- Shall ensure their employees complete required medical examinations.

- Shall notify the IH or safety specialist when there is a significant change to a work process (new work procedures, equipment, or a new hazard) so a health hazard assessment can be completed.

c. Employees

- Shall complete the training requirements in paragraph 2.06.4.
- Shall actively participate in health hazard assessments by wearing exposure monitoring equipment, providing input on job tasks and operations, and providing information on areas where potential exposures may exist.
- Shall review the JHA prior to conducting a job task and discuss any unaddressed concerns/hazards with the supervisor.
- Shall immediately notify their supervisor of any signs or symptoms related to any hazardous materials used in their job tasks or from environmental exposures.
- Shall immediately notify their supervisor when engineering controls or other methods used for controlling potentially hazardous environments are malfunctioning.
- Shall immediately notify their supervisor when their personal protective equipment (PPE) is damaged so it may be repaired or replaced.

d. Regional Safety Managers

- Shall support a region-wide health hazard assessment program to ensure that an effective process is in place to eliminate or reduce occupational health hazards and employee exposures.

e. Regional/Local Industrial Hygienists

- Shall coordinate with first-line supervisors and safety managers/safety specialists to conduct health hazard assessments that includes information provided in paragraph 2.06.2, General Requirements, and paragraph 2.06.8, Safe Practices of this RSHS.
- Will conduct exposure assessments for individual work task or agent exposures. In this process the industrial hygienist will determine the appropriate occupational exposure limit (OEL) for the agent. American Conference of Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) will be used when technically feasible and most protective; otherwise, use the next lowest achievable National Institute for Occupational Safety and Health recommended exposure limits or OSHA permissible exposure limits (PELs) as feasible.
- Shall use health hazard assessment results to determine additional industrial hygiene program requirements, implementation of control strategies to reduce employee exposures, employee training, and appropriate medical surveillance requirements.
- Shall conduct or oversee monitoring for employee exposures to hazardous materials or environments.
- Shall ensure employees receive monitoring results within 15 days of receipt of the laboratory report and will review the results with the employee and the first-line

supervisor to ensure they understand the results, any actions required based on the results, and will maintain confidentiality with any employee medical information.
- Shall ensure the appropriate human resources officer receive employee monitoring results to place in the employee's medical folder.
- Shall provide input, language, and guidance for occupational health provisions in contracts.
- Shall provide guidance on design, selection, implementation, and testing of engineering controls to limit exposure during job tasks and operations as requested.

f. Safety managers and Safety Specialists
- Shall work with first-line supervisors, regional/local IH, and field locations to conduct health hazard assessments.
- Shall complete the training requirements in paragraph 2.06.4

g. Reclamation Industrial Hygienist
- Shall develop strategies to address Reclamation-wide health hazard issues related to harmful or potentially harmful employee exposures.
- Shall provide technical assistance, education, direction, and support to regional/local IHs for health hazard assessments as requested.
- Shall work with the regional IHs to develop a Reclamation-wide electronic system for maintaining health hazard assessment results.

h. Human Resources Officers
- Shall maintain received medical examination results, clearance documentation, and employee exposure monitoring records in the employee's medical folder according to 29 CFR 1910.1020(d)(1), Access to Employee Exposure and Medical Records, the Privacy Act of 1974 (P.L. 93-579), and provide the regional/local IH, local safety specialist/manager, and/or first-line supervisor with the clearance results as requested.

4. Training

a. Initial Training

First-line supervisors, in coordination with the safety manager/safety specialist and/or the region IH, shall coordinate employee training for conducting health hazard assessments that includes the following minimum elements:

- benefits of performing health hazard assessments,
- how to identify tasks or environments that have the potential for employee exposure to hazardous materials,
- ways to measure and identify employee exposure and risks associated with job tasks,
- methods prioritizing actions to reduce employee exposures,

- use of the hierarchy of controls to select the appropriate controls to reduce employee exposures,
- methods to assess the performance of the controls as it relates to employee exposures,
- importance of using consistent assessment techniques and maintaining work site data, and
- retention requirements for employee medical records and workplace exposure.

b. Refresher Training

The first-line supervisor shall determine the frequency of refresher training in consultation with the safety manager/safety specialist and the regional or local IH.

c. Recordkeeping

The first-line supervisor shall ensure training records are kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment

The first-line supervisor, in coordination with the safety manager/specialist and the regional/local IH, shall assess work areas reviewing job tasks and work areas for potential employee exposures to hazardous materials, environments, and determine the appropriate controls, equipment, and PPE to reduce employee exposures.

- Health Hazard Assessment Process. The assessment process shall include the following minimum elements:

    - review processes in work areas,
    - anticipate and document any recognized hazards,
    - involve employees when reviewing job tasks, processes, and hazardous materials used in work areas,
    - identify and monitor exposures and risks,
    - evaluate environmental conditions (e.g., heat, cold, noise),
    - identify and recommend feasible environmental controls,
    - implement hazard controls,
    - train employees on new procedures and/or controls,
    - develop and implement procedures to evaluate new processes and equipment,
    - develop and implement procedures to confirm controls are working to reduce exposures, and
    - when and where job plans are utilized, a copy of the health hazard assessment, where required, will be attached to the job plan.

b. Safety Measures

- Hierarchy of Controls. The first-line supervisor, in coordination with the safety manager/safety specialist and the regional/local IH, shall implement the appropriate controls, below, to reduce potential employee exposure in their work areas:

    - eliminate the hazardous materials used, or reduce quantities or concentrations,
    - substitute to a less hazardous material or procedure,
    - identify and implement engineering controls to prevent or reduce exposures (e.g., local exhaust ventilation, physical containment, real-time sensors and monitors) and ensure the equipment is functioning properly,
    - implement administrative controls and work procedures to prevent exposures (e.g., alter how the job tasks or procedures are done, reduced working times in high exposure areas, install signs, train employees on specific job procedures),
    - reduce the work time for tasks with potential exposures to hazardous materials and physical hazards (e.g., noise, vibration, temperature, radiation),
    - schedule job tasks where there is a potential for exposing other employees in a way that minimizes exposure for all, and
    - provide PPE, as the last resort, for employees and train them accordingly.

6. Pre-job Briefing and Planning Requirements

a. Job Hazard Analysis

The first-line supervisor, in coordination with the safety manager/specialist and the regional/local IH, shall address the appropriate elements listed in paragraph 2.06.5.b, Safety Measures of this RSHS, in JHAs where employee exposure is a potential risk factor.

7. Personal Protective Equipment

First-line supervisors, in coordination with the safety manager/safety specialist and the regional/local IH, shall provide and train employees in the use of required PPE to minimize exposure to hazard in the work area.

a. Respiratory Protection

Employees shall use respiratory protection and adhere to the requirements in RSHS Section 2.08, Respiratory Protection, when:

- engineering and work practice controls are not adequate to reduce exposures below the action level (AL) or below 50 percent of the OEL, and
- interim protection measures are in place during a health hazard assessment, and
- exposure to a Federal OSHA-regulated substance exceeds the AL or OEL.

b. Additional PPE Selection

Refer to RSHS Section 1.07, Personal Protective Equipment, for selection, use, and maintenance requirements.

8. Safe Practices

a. Air Contaminant Control Plan

The regional/local IH, in coordination with the first-line supervisor and the safety manager/safety specialist, shall implement an air contaminant control plan when personal or area air monitoring results conducted during a health hazard assessment equal or exceed a Federal OSHA regulated AL or 50 percent of the OEL if an AL does not exist. The plan shall include the following minimum elements:

- means to reduce exposures levels using relevant controls outlined in paragraph 2.06.5.b., Hierarchy of Controls of this RSHS,
- periodic air monitoring to ensure the controls implemented are effective,
- procedure or guidelines to ensure JHAs for operations with air contaminant exposure include control measures and PPE, and
- guidelines for any medical surveillance program requirements.

b. Noise Control Plan

The regional/local IH in coordination with the first-line supervisor and the safety manager/specialist shall implement a noise control plan when stationary or portable sources expose employees to 85 decibels (dBA) or greater. The plan shall include the following minimum elements:

- conducting noise surveys and identifying sources that expose employees to 85 dBA or greater,
- identifying control measures for sources producing sound levels to 85 dBA or greater,
- periodic noise monitoring to ensure the controls implemented are effective,
- procedures to ensure JHAs for operations with noise levels to 85 dBA or greater include updated control measures and PPE,
- means to reduce exposures levels using relevant controls outlined in paragraph 2.06.5.b., and
- implement a hearing loss prevention program outlined in RSHS Section 2.07, Hearing Loss Prevention Program.

c. Medical Surveillance

- Notification of Monitoring Results. The regional/local IH shall notify the first- line supervisor and affected employee(s) and review the monitoring results within 15 days after receiving the report, covering the following elements, as a minimum:

- employee name, job title, and work location,
- job task(s), and duration monitored,
- employee monitoring results compared to the PEL or AL if applicable, and
- explanation of results and recommendations to reduce potential exposure (if applicable).

- Medical Surveillance Program. The regional/local IH, in coordination with the first-line supervisor and the safety manager/safety specialist, shall review health hazard assessments and monitoring results that would potentially require placing employees in a medical surveillance program when employee monitoring results meet or exceed specific exposure limit requirements outlined in Federal OSHA regulations for substances requiring medical surveillance (e.g., lead, asbestos, silica, noise, suspect carcinogens).

d. Potable Water

An adequate potable water supply must be provided in all places of employment. Cool, potable drinking water must be provided. Supply drinking water from sources that meet the quality standards published in the U.S. Public Health Service Drinking Water Standards published in 42 CFR Part 72 approved for drinking purposes by the State or local authority having jurisdiction. Keep potable containers used to dispense drinking water tightly closed, equipped with a dispensing tap labeled as “DRINKING WATER,” and in a sanitary condition. Water must not be dipped from any potable water container. Drinking directly from the container is prohibited unless a properly installed drinking fountain with a guarded orifice is provided. Do not use containers to dispense or distribute drinking water for any other purpose. Provide fountain-type dispensers or one-use paper cups at each dispenser. The Government Accountability Office (GAO) prohibits the purchase of one-use paper cups for employees in “office settings” as the GAO has determined drinking cups in office settings to be “personal items.” Within the Bureau of Reclamation, these one-use paper cups will most commonly be used in remote, isolated field facilities and larger facilities where piped-in potable water is not readily available. These are not considered office settings. Where non-potable water dispensers are present, they must be posted as follows:

CAUTION
WATER UNSAFE FOR DRINKING,
WASHING OR COOKING

e. Washing Facilities

Provide adequate washing facilities for all employees to maintain healthful and sanitary conditions. Such facilities must be located within, or near the worksite. Maintain each wash facility with either hot and cold or tepid water, soap, and an individual means of drying.

f. Food Consumption

Designate a clean area for consuming food and drink at each work location. It is prohibited to use restrooms, laboratories, hazardous materials storage areas, industrial shops, or other areas exposed to biological or chemical hazards as breakrooms or food consumption locations.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.07 Hearing Loss Prevention Program

1. Scope

This section establishes minimum requirements for a Reclamation Hearing Loss Prevention Program (HLPP) to ensure safety and occupational health hazards related to hearing are appropriately addressed. The HLPP applies to all employees working at or visiting facilities who are exposed to noise at or above 85 decibels, A scale (dBA), for an 8-hour time-weighted average (TWA) using a 3-dBA exchange rate.

2. General Requirements

a. 3dB Exchange Rate

Reclamation shall use the more protective American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Value (TLV) exchange rate of 3 dB to be proactive in reducing noise-induced hearing loss (NIHL) as shown in Table 2.07-1.

TABLE 2.07-1 ACGIH 3dB Exchange Rate

Time to Reach 100% Noise Dose	ACGIH 3dB Exchange Rate Exposure Level
10 hours	84
8 hours	85
4 hours	88
2 hours	91
1 hour	94
30 minutes	97
15 minutes	100

b. Controls

As feasible, engineering and administrative controls shall be implemented as the first line of defense when employees are exposed to sound levels greater than an 8-hour TWA of 85 dBA. Hearing protection devices (HPDs) shall be used when engineering and/or administrative controls fail to reduce the sound levels below the 8-hour TWA of 85 dBA.

c. Exposure Limit

An exposure of 85 dBA, based on an 8-hour TWA, shall be used when determining if personal dosimetry results have been exceeded.

d. Noise Measurements

All continuous, intermittent, and impulsive sound levels ranging from 80 dB to 140 dB shall be integrated when conducting noise measurements.

e. Equipment Purchases

Those who are responsible for purchasing tools/equipment shall review the Buy Quiet requirements outlined in paragraph 2.07.7.b to help reduce employee noise exposure.

3. Responsibilities

a. Reclamation Safety and Occupational Health Office

- Shall provide technical support to assist Regional Safety Managers and Program Coordinators (PC) with implementing the HLPP.

b. Area Office Managers

- Shall provide necessary resources to implement and maintain the procedures in the HLPP.
- Shall select an Area Office Program Coordinator, if a Regional Program Coordinator (RPC) has not been designated or in addition to, and provide them with the authority to implement the HLPP.

c. Regional/Area Office Program Coordinators

- Shall evaluate, review, and approve HPDs used at their facilities and provided for all affected employees.
- Shall coordinate with the Regional Industrial Hygienist (IH) to conduct noise monitoring to determine if noise levels are at or above the exposure limit for an 8-hour TWA.
- Shall provide employees written notification of results for all personal noise dosimetry conducted, and ensure it's placed in the employees' permanent medical file within the Human Resources Office. This documents the results and indicates if they have been exposed to noise at or more the exposure limit for an 8-hour TWA.
- In coordination with the First-Line Supervisor, shall ensure that annual audiometric testing is conducted for all employees in the HLPP for their responsible area(s), and that quiet period requirements are followed according to 2.07.5.f.
- In coordination with the First-Line Supervisor, shall ensure that areas where noise levels are greater than 85 dBA have been marked with either Caution or Danger signs per paragraph 2.07.8.
- In coordination with the First-Line Supervisor, ensure that employees that have experienced a standard threshold shift (STS), compared to their baseline audiogram, are informed of this fact in writing within 21 days of the determination.
- In coordination with the First-Line Supervisor, determine whether to retest within
- 30 days of the initial test date for employees where the audiogram indicates an STS or recordable hearing loss.
- Shall maintain a list of all employees who are required to participate in the HLPP.
- In coordination with the First-Line Supervisor, refer employees identified with medical pathology that is thought to be caused or aggravated by using hearing protectors to an

audiologist, otolaryngologist, or physician that will review the audiogram and determine whether there is a need for further evaluation.

- Shall ensure any hearing tests reveal that an employee has experienced a work-related STS in one or both ears and that the employee's total hearing level is 25 dB or more above audiometric zero (averaged at frequencies 2000, 3000, and 4000 Hz) in the same ear(s) as the STS, that the tests are recorded in the Safety Management Information System (SMIS) as a hearing loss within 7 days of receiving the results.

d. First-Line Supervisors

- Shall ensure that employees under their supervision receive annual HLPP training and audiometric testing as required by this section.
- Shall ensure that documentation of training and testing required by the HLPP are retained in the Department of the Interior (DOI) learning management system.
- Shall ensure that HPDs are available and worn by their affected employees or visitors in their area(s) of responsibility as required by this section.
- Shall ensure that personnel under their supervision have been trained in the proper use, selection, maintenance, and storage of HPDs.
- In coordination with the Area Office PC and/or RPC, shall participate in a review of annual audiogram results for their employees that have shown an STS or OSHA-recordable hearing loss to ensure that they are refitted and retrained in the use of HPDs.

e. Employees

- Shall use HPDs when noise levels are above 85 dBA or above 82 dBA when working more than an 8-hour shift.
- Shall use, care, maintain, and store HPDs according to manufacturers' instructions.
- Shall ensure that HPDs are replaced when they show wear and tear from overuse or when they are defective and do not provide the level of protection for which they were designed.
- Shall report any noise exposure concerns to their First-Line Supervisor and/or PC.
- Shall participate in annual HLPP training and audiometric testing.

f. Regional Safety Managers

- Shall appoint an RPC as deemed necessary for their region.
- Shall promote the development and implementation of an HLPP within their region and provide support as needed.
- In cooperation with the RPC and/or Area Office PC, shall perform program implementation checks to ensure compliance with this section.

g. Industrial Hygienists

- Shall provide technical support for their region, such as assisting in implementing the HLPP, providing dosimetry to determine employee exposure, coordinating sound level surveys, and conducting periodic reviews for compliance with the HLPP.
- Shall review employee audiogram results that an audiologist, otolaryngologist, or physician has identified as work-related STS or OSHA-recordable hearing loss to determine if further investigation, in coordination with the Area Office Program Coordinator, is necessary.

h. Project Managers/Acquisitions

- Shall coordinate the purchase of new equipment that meets the Buy Quiet requirements outlined in paragraph 2.07.7.b to reduce employee noise exposure.
- Shall include noise levels and technical performance criteria in specifications when purchasing or designing new equipment that is expected to produce levels of 80 dBA or higher.

i. Human Resources Office

- Shall ensure that pre-employment physicals include baseline audiometric evaluations when required by specific physical job requirements.
- Shall maintain all audiometric test results in an employee's medical folder and shall provide Regional Industrial Hygienists, the RPC and/or area office PC access to preplacement and annual audiograms to facilitate the Industrial Hygienist's assessment of work-related STS and/or OSHA-recordable results.

4. Training Requirements

a. Initial

All employees exposed to noise at or above an 8-hour TWA of 85 dBA must participate in the HLPP and receive training. Training shall include, but not necessarily be limited to the following subjects:

- the effects of noise on hearing, including a detailed explanation of the impact of hearing loss and the ease of protection and prevention,
- the purpose of HPDs; the advantages, disadvantages, and attenuation of various types of HPDs; and instructions on selection, fitting, use, and care of HPDs,
- how to evaluate the effectiveness and test the fit of HPDs, including pre-fit, fit, and post-fit evaluation procedures,
- the purpose of audiometric testing and an explanation of test procedures,
- how to understand audiogram results, and
- how an STS and OSHA-recordable result are determined.

b. Refresher Training

All employees in the HLPP must attend training annually.

c. Lack of Proficiency

Employees observed to be incorrectly wearing their HPDs for job tasks that require them shall be retrained by their supervisor on proper fit and must demonstrate how to wear them correctly immediately or when it's safe to do so, but at least by the end of their shift.

d. Recordkeeping

- Training Records. Maintain training records for at least 2 years in the Department of the Interior (DOI) learning management system. The employer must provide these records to the Deputy Commissioner of Labor for Occupational Safety and Health (or their designee) upon request.
- Noise Measurements. All personal dosimetry records must be kept in the employee's medical file for the duration of their employment.
- Medical, Exposure, and Monitoring Records. Maintain employee medical, exposure, monitoring, and training records per 29 CFR 1910.1020, the Privacy Act of 1974 (P.L. 93-579), and 5 CFR 293. See also "Recordkeeping Requirements" in RSHS Section 2.06.

5. Hazard Identification, Assessment, and Safety Measures

a. Health Hazard Assessments

Health hazard assessments shall be conducted according to RSHS Section 2.06.2, which requires an exposure assessment and monitoring when evaluating new processes, establishing baselines, and evaluating engineering controls for noise exposure.

b. Noise Control Plan

As required by RSHS Section 2.06.8.b, a noise control plan shall be developed and implemented when either stationary or portable sources expose employees to noise levels of 85 dBA or greater.

c. Job Hazard Analysis (JHA)

A JHA must be completed for each job task that identifies specific sources of noise, the appropriate control measures, and/or personal protective equipment (PPE).

d. Monitoring Requirements

A monitoring program must be implemented when an employee's exposure equals or exceeds an 8-hour TWA of 85 dBA to identify employees that need to be included in the HLPP and determine the appropriate HPDs.

- Initial Determination. Sound level measurements may be used to screen the work environment to determine if dosimetry is required.
- Personal Dosimetry. Representative personal dosimetry shall be conducted for high worker mobility, when a worker experiences significant variations in sound level, or when there is a significant component of impulse noise.
- Reassessment. Monitoring shall be repeated whenever a change in operations or equipment increases noise exposure such that additional employees may be exposed at or above the exposure level, and/or HPDs are inadequate to reduce levels to 85 dBA or less for employee protection.

e. Audiometric Testing Program

Audiometric testing shall be performed by a licensed or certified audiologist, otolaryngologist, or another physician, or by a technician who is responsible to an audiologist, otolaryngologist, or physician.

- Required Credentials for Technicians. Technicians must either be certified by the Council of Accreditation in Occupational Hearing Conservation or have satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining, and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometers does not need to be certified.
- Parameters of Audiometric Tests. All audiometric tests must be conducted in accordance with American National Standards Institute (ANSI) S3.21-2004 and Acoustical Society of American (ASA) that includes audiometric test frequencies of 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz for each ear.

f. Baseline and Annual Audiometric Testing

- Testing Requirements. Audiometric testing shall be conducted on all employees whose exposure levels equal or exceeds the exposure limit. The conditions of and the equipment used for the testing must comply with the requirements stated in 29 CFR 1910.95.
- Pre-test Quiet Period. Audiograms must be preceded by at least 14 hours without employee exposure to workplace noise. Employees should also avoid exposure to high levels of non-occupational noise during the 14 hours preceding the test.
- Baseline Audiograms

    - Baseline Testing. If a mobile test van is not used, then an employee shall receive baseline audiometric testing within 6 months of their first exposure at or above the exposure limit. Subsequent audiograms will be compared to this baseline.
    - Quiet Period Requirements. Quiet period requirements for baseline audiograms may be met by the employee(s) wearing hearing protection that reduces their exposure to a noise level of 85 dBA or lower; however, a true quiet period that prevents

employee exposure to workplace noise and limits employee exposure to non-occupational noise is preferred.

- Interim Protection. Employees must be trained on the use of HPDs and required to wear them until they receive their baseline audiogram.
- Mobile Test Vans. If mobile test vans are used to meet the baseline audiometric testing requirement, then the employer has up to 1 year from the employee's first exposure that meets or exceeds the exposure limit to get a valid baseline audiogram. During testing, mobile test vans shall be in an area away from activities generating noise to ensure accurate results.

- Annual Audiograms

  - Audiogram Frequency. At least annually, after the baseline audiogram, the employee shall receive a new audiogram to determine by comparison if an STS has occurred.
  - Quiet Period Requirements. Quiet period requirements for annual audiograms may be met by the employee(s) wearing hearing protection that reduces their exposure to a noise level of 85 dBA or lower; however, a true quiet period that prevents employee exposure to workplace noise and limits employee exposure to non-occupational noise is preferred.
  - Audiogram Results. Written audiogram results shall be provided to the employee immediately following the test.

g. STS Determinations

- Age Correction Requirements. For determining whether an STS has occurred, age correction is acceptable for assessing a change in hearing level. 29 CFR 1910.95 Appendix F, Calculations and application of age corrections to audiograms, may be used as a resource.
- Audiogram Retesting. If the annual audiogram results show that an STS has possibly occurred, then the employee may be retested within 30 days of the initial test date. For this retest/confirmation audiogram, earmuffs or earplugs should not be used to achieve the required 14-hour pre-test quiet period.
- STS Procedures. If it is determined that an STS is work-related or aggravated by work-related noise, then implement the following procedures:

  - Employees not wearing hearing protection must be fitted with HPDs, trained in their care and use, and required to use them.
  - Employees already using HPDs must be refitted and retrained in their care and use. Hearing protection offering greater attenuation may be selected and issued.

- STS Notification. An employee shall be notified in writing within 21 days of the determination that an STS has occurred.

h. Confirmed OSHA-Recordable Audiogram

All annual audiograms that indicate an OSHA-recordable result must be confirmed by a second audiogram within 30 days of the test results. The results of the retest shall be considered the annual audiogram and shall be recorded in SMIS as outlined in paragraph 2.07.3.c.(10). For more information, review 29 CFR 1904.10, Recording Criteria for Cases Involving Occupational Hearing Loss.

i. Non-Persistent Threshold Shift

If subsequent audiograms indicate that a previously determined threshold shift is not persistent, then the employee must be informed of the new audiometric interpretation.

j. Revised Baseline Audiograms

Annual audiograms may be substituted for the baseline audiogram when in the judgment of the professional evaluating the audiogram determines the STS shown in the annual audiogram is persistent or the hearing threshold in the annual audiogram shows significant improvement over the baseline audiogram.

k. Clinical Referral

Employees identified with medical pathology that is thought to be caused or aggravated by using hearing protectors shall be referred to an audiologist, otolaryngologist, or physician, who shall review the problem audiogram and determine whether there is a need for further evaluation.

6. Personal Protective Equipment (PPE)

a. Hearing Protection Devices

HPDs shall be made available at no cost to all employees exposed to noise at or above the exposure limit. Employees who have experienced an STS and/or who are exposed to noise above the exposure limit are required to wear hearing protection.

- HPD Evaluation. HPDs must be evaluated and approved for use by the RPC and/or Area Office PC per 29 CFR 1910.95 Appendix B, “Methods for Estimating the Adequacy of Hearing Protection Attenuation.”
    - HPD Attenuation Hearing protection must attenuate employee noise exposure to equal or less than the exposure limit.
    - Re-evaluation. The competency of HPDs shall be reevaluated whenever employee noise exposure increases to the extent that the HPDs provided may no longer provide adequate attenuation.

b. Double Hearing Protection

Employees shall be provided double hearing protection when noise levels are greater than or equal to 100 dBA. Doubling-up on hearing protection (e.g., earplugs and muffs) will increase the attenuation decibel by only 5 dB, as explained in the next paragraph.

- Attenuation Calculation for Double Hearing Protection. to calculate the attenuation offered by double hearing protection:
    - Calculate the field-adjusted noise reduction rating (NRR) for the better protector using the standard formula (NRR – 7) × 0.5.
    - Add 5 dB to this field-adjusted NRR to determine total attenuation. Subtract the total attenuation from the employee's 8-hour TWA exposure to determine attenuated exposure.
    - For example, an employee with a TWA exposure of 100 dBA is using earplugs with an NRR of 29 and ear muffs with an NRR of 25. The field-adjusted NRR of the earplugs (the better protector) is (29 – 7) × 0.5, or 11 dB. The total attenuation with both earplugs and ear muffs is 11 dB + 5 dB, or 16 dB. The employee's attenuated exposure is 100 dB – 16 dB, or 84 dB.

7. Safe Practices

a. Required Safe Work Practices

Employees in the HLPP shall follow these safe work practices:

- always wear hearing protection in environments where noise levels are at or above the exposure limit,
- ensure that hearing protection fits properly,
- replace hearing protection if damaged or if it has lost its resiliency,
- discard disposable hearing protection at the end of the work shift, and
- attend annual training to understand what audiogram results mean.

b. Buy Quiet Program

Project Managers, acquisitions staff, and other appropriate staff shall implement a Buy Quiet procedure that includes the following elements:

- purchase replacement equipment/machinery that ideally produces noise emission levels less than 85 dBA or at least lower noise levels than the previous machinery/equipment,
- use educational materials to promote Buy Quiet to employees, and
- use cost-benefit analysis, as needed, to determine the return on investment to show the true cost of purchasing one piece of equipment over another.

8. Communication Requirements

a. Noise Exposure Signs

- Caution Noise Levels. Post signs for all areas and/or label equipment that has noise levels between 85 and 100 dBA using the OSHA or ANSI format and the following wording:

FIGURE 2.07-1: Noise Level Caution Signs

CAUTION **High Noise Levels Hearing Protection Required**

- Danger Noise Levels. Post signs for all areas and/or label equipment that has noise levels greater than or equal to 100 dBA using the OSHA or ANSI format and the following wording:

FIGURE 2.07-2: Noise Level Danger Signs

DANGER **High Noise Levels** **Double Hearing Protection Required**

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 2.08 Respiratory Protection Program

1. Scope

This section establishes the minimum requirements for a Bureau of Reclamation (Reclamation) Respiratory Protection Program (RPP) to ensure respiratory safety and occupational health hazards are appropriately addressed. The RPP applies to all employees working at, or visiting, facilities that are exposed to airborne contaminants anticipated to meet, or exceed, 50 percent of the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) or American Conference of Government Industrial Hygienists (ACGIH) threshold limit value (TLV).

2. General Requirements

a. Identify and Evaluate Respiratory Hazards

The evaluation shall include an estimate of exposures to respiratory hazard(s) (e.g., fumes, mists, dusts, vapors, gases, smoke, sprays) and an identification of the contaminant's chemical state and physical form. Where exposures cannot be estimated, the atmosphere shall be considered immediately dangerous to life or health (IDLH) until an evaluation is conducted and determined not to be IDLH.

b. Hierarchy of Controls

When a suspected respiratory hazard is reported to safety professionals or supervisors, any feasible engineering and/or administrative controls to reduce the hazard must be attempted prior to selecting personal protective equipment (PPE) to reduce employee exposure. PPE is the final means of protection and used only if the other control methods are not feasible.

c. Job Hazard Analysis (JHA)

A JHA must be completed for all tasks that require the use of respiratory protection and must, at a minimum, address the perceived respiratory hazard, anticipated employee exposure, what type of respirator is required, appropriate cartridge and/or filter, engineering and administrative controls to reduce the hazard.

d. Written Program

Respiratory PPE shall not be used until a written program is implemented and must be updated when changes in workplace conditions affect respirator use. At a minimum, the written program shall include procedures for the following elements:

- employee medical requirements,
- user training including proper use of respirators, proper way to put on and take off a respirator, and respirator types and their limitations,
- selecting, cleaning, storing, and maintaining respirators,

- proper routine and emergency use of respirators,
- ensuring tight-fitting respirators using OSHA-accepted fit testing protocols from 29 CRF 1910.134, Appendix A Fit Testing Procedures (Mandatory),
- ensuring breathing air for atmosphere-supplying respirators (SARs) is of adequate quality, quantity, and flow,
- evaluating the effectiveness of the RPP, and
- voluntary use.

3. Responsibilities

a. Area Office Managers

- Shall ensure all affected employees complete training and comply with the RPP.
- Shall designate a Program Coordinator (PC) to implement the RPP.

b. Regional/Area Office PCs

- Shall develop and maintain a written RPP and list of participants for their site(s).
- Shall work with the regional Industrial Hygienist (IH) to identify, evaluate, and monitor the respiratory hazards, including the contaminants' chemical state and form, and employees' potential exposure at their site(s) as required by a workplace assessment and/or Federal/State OSHA regulatory requirements.
- Shall collaborate with the supervisor(s) to ensure only National Institute for Occupational Safety and Health (NIOSH) certified respirators are selected and used, consistent with respiratory hazards, environmental factors, and user activities that affect respiratory performance and reliability, in compliance with the conditions of the respirator's certification.
- Shall schedule, or designate an individual to schedule, monthly inspections of emergency respirators and ensure escape-only respirators are inspected prior to each use, according to the manufacturer's recommendations.
- Shall conduct or arrange for the regional IH or other qualified person to conduct, and document annual training and fit tests for RPP participants.
- Shall assist the supervisor(s) and physician or other licensed health care professional (PLHCP) in scheduling initial and/or follow-up, for employees whose initial examination deems it necessary for clearance, medical evaluations/examinations and provide the 29 CFR 1910.134, Appendix C Respirator Medical Evaluation Questionnaire (Mandatory).
- Shall annually evaluate the workplace with the supervisor(s) to review the implementation of the elements of the RPP. At a minimum, workplace observations, document review, and consultation with participants shall be used, and any findings must be entered into the Inspection Abatement System (Section 1.23, Safety Inspection and Abatement General Requirements) for tracking corrective actions.

c. First-Line Supervisors

- Shall coordinate with the PC to ensure RPP participants attend scheduled training, medical evaluations, and fit tests.
- Shall notify the PC when a respiratory hazard is discovered in their responsible work area(s).
- Shall ensure, within their area(s) of responsibility, that all respiratory hazard engineering controls are working properly and that malfunctioning controls are either reported and repaired immediately or replaced by other controls that offer the same or higher protection.
- Shall ensure all JHAs in their area(s) of responsibility identify potential respiratory hazards and the appropriate controls for those hazards.
- Shall ensure the PC is included in the review for all JHAs involving respiratory hazards in their area(s) of responsibility.
- Shall ensure employees within their area(s) of responsibility participate in workplace exposure/task assessments that may include wearing exposure monitoring equipment.

d. Employees

- Shall notify their supervisor or team lead whenever a respiratory hazard is suspected/discovered.
- Shall attend scheduled medical evaluations and examinations, initial and annual fit tests, and training.
- Shall maintain and store their respirator in a clean, sanitary container, or other device, protect it from adverse conditions or air contaminants that would compromise its integrity, and report any damage/defects to the supervisor for replacement.
- Shall report health concerns, or any suggestions regarding the RPP, to their supervisor and/or PC.
- Shall not enter atmospheres that are oxygen deficient and/or contain contaminants that their respirator will not provide protection.
- Shall be clean-shaven before they put on a tight-fitting respirator so that facial hair does not interfere with the respirator's seal.

e. Regional Safety Managers

- Shall appoint a PC, as deemed necessary, for their region.
- Shall assist in developing and establishing the RPP when necessary and perform periodic spot checks to ensure compliance with this section.

f. Regional HIs

- Shall provide technical assistance that includes, but is not limited to, workplace evaluations, exposure monitoring, respirator selection, fit tests, and training.

g. Project Managers/Acquisitions

- Shall coordinate with the PC to purchase only NIOSH-certified respirators.

h. Human Resources

- Shall ensure that pre-employment physicals include a medical evaluation when required by specific physical job requirements according to paragraph 2.08.6.c Medical Evaluation.
- Shall maintain all respirator medical evaluation results in the employee's medical folder for 30 years, or for at least 20 years after termination of employment, whichever is longer.

4. Training Requirements

a. Initial Training

Employees who are required to wear respiratory protection shall be medically qualified per paragraph 2.08.6.c Medical Evaluation, properly trained, and fit tested per paragraph 2.08.6.d Fit Testing before wearing any protective respiratory equipment. At a minimum, training shall include the following topics:

- why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect,
- limitations and capabilities of the respirator,
- selecting, maintaining, and storing the proper respirator and cartridge/filter for the job task,
- how to inspect, put on and remove, use, and check the seals of the respirator,
- effective respirator use in an emergency situation, including respirator malfunctions,
- recognizing medical signs and symptoms that may limit or prevent the effective use of the respirator,
- voluntary respirator use requirements from 29 CFR 1910.134, Appendix D,
- Information for Employees Using Respirators When Not Required Under Standard,
- proper and improper function of engineering controls in their area(s), and
- the requirements outlined in this section.

b. Annual Refresher Training

Annual refresher training and fit tests are required for all employees identified in the RPP. Additional training is required when there are changes in the workplace or in the type of respiratory protection.

c. Proficiency

Respirator users must know what type of respirator cartridge/filter is acceptable for the airborne contaminants they could potentially be exposed to, what type of respirator is required for the job

task, and what types of controls need to be implemented to reduce the airborne contaminant level.

d. Lack of Proficiency

Retraining is necessary when the respirator user demonstrates a lack of knowledge of correct respirator use, improper cartridge selection, or the program elements in this section.

e. Records Management

All Reclamation training records shall be kept in the Department of the Interior (DOI) system for tracking training.

5. Hazard Identification, Assessment, and Safety Measures

a. Hazard Identification and Assessment

Work areas and activities must be assessed as outlined in paragraph 2.08.3.b Regional/Area Office PCs Responsibilities to determine if real or potential respiratory hazards exist and to provide the appropriate controls to reduce employee exposure.

b. Respiratory Hazard Work Site Evaluation

The work site evaluation, at a minimum, shall include:

- identification of the respiratory hazard, the chemical and physical form, and an estimate or measurement of employee exposure,
- the exposure limit as dictated by the OSHA PEL or ACGIH TLV or NIOSH Pocket Guide to Chemical Hazards,
- the hazard ratio (airborne concentration to exposure limit),
- eye irritation and skin absorption, and
- any IDLH or unknown atmospheres.

c. Respirator User and Environmental Factors Evaluation

The evaluation of user and environmental factors, at a minimum, shall include:

- work activities and stress (heavy, medium, light),
- configuration and size of the workspace,
- equipment within the workspace,
- mobility requirements of the employee,
- workspace temperature and humidity, and
- employee communication methods.

d. Safety Measures

Respirator users shall be aware of, and abide by, the following safety measures:

- never use a filtering facepiece (aka dust mask) or an air-purifying respirator (APR) in an oxygen-deficient atmosphere,
- never enter IDLH atmospheres without the proper equipment or training,
- APRs approved for protection against organic vapors or acid gases may only be used when the air contaminant is known and has adequate warning properties such as smell, irritation, or taste,
- ensure cartridge/canister/filter is appropriate for the airborne contaminant, and
- notify the PC and supervisor of any changes in the workplace or your physical condition that would make the current respiratory protection inadequate.

6. Safe Practices

a. Respirator Selection, Use, and Maintenance

- Selection. Respirators shall be selected and provided according to the worksite- specific respiratory hazard(s) that an employee is potentially exposed to and any user or environmental factors that affect respirator performance and reliability. Respirator selection must be based on assigned protection factors that meet or exceed the required level of protection 29 CFR1910.134(d)(3)(i)(A), Table 1 “Assigned Protection Factors”.
- APR. An APR with an End of Service Life Indicator (ESLI) cartridge/cannister will be selected, if possible. Respirators not using ESLI cartridges/canisters must develop a change-out schedule and/or follow the manufacturer’s recommendations. The following are examples of filters/cartridges that may be used with APRs.

    - Particulate filters. These filters capture dusts, mists, and fumes, but they do not protect against gases and vapors. Particulate filters must be certified according to 42 CFR 84, Respiratory Protective Devices.
    - Gas and vapor cartridges. These cartridges are typically used when only hazardous gases and vapors are present in the air, because they do not protect against particulates.
    - Combination cartridges. These cartridges are normally used in atmospheres that contain hazards of particulates, gases, and vapors.

- Change-Out Guidance for a Vapor Cartridge/Canister. One tool that can be used to estimate organic vapor cartridge life is the “Rule of Thumb” from the American Industrial Hygiene Association publication The Occupational Environment — Its Evaluation, Control and Management. This method is a guide and not meant to be the only method for determining service life. The “Rule of Thumb” states:

    - if the concentration of the chemical is less than 200 parts per million (ppm) and the chemical's boiling point is greater than 70°C, you can expect a service life of 8 hours at a normal work rate (assume a shorter service life with greater work rates),

  - reducing air contaminant concentrations by a factor of 10 will increase the service life by a factor of 5, and
  - humidity above 85 percent reduces service life by 50 percent.

- Change-Out Requirements for a Filtering Facepiece and a Cartridge/Canister. For filtering facepieces and cartridges/cannisters, use the following requirements and manufacturer's recommendations to change-out when:

  - the filter is damaged and is no longer protective or becomes soiled and is no longer clean/sanitary,
  - breathing resistance noticeably increases, causing discomfort, or
  - the user experiences a breakthrough and notices either a smell, irritation, or taste.

- SAR. The following types of SARs are used:

  - Supplied- Air or Airline. Delivers clean, breathable air from an uncontaminated source for long periods of time and is used for extended work times in non-IDLH atmospheres.
  - Combination. Has an auxiliary self-contained air supply that is used if the primary supply fails.
  - Self-Contained Breathing Apparatus (SCBA). Consists of a wearable clean air supply pack and is used when there is a short time to enter and escape from a space with atmospheres that are, or may be, IDLH.

- Breathing Air Quality and Use. Compressed breathing air shall meet the requirements for Grade D breathing air described in American National Standards Institute/Compressed Gas Association CGA G-7.1-2018, Commodity Specification for Air:

  - oxygen content of 19.5–23.5 percent,
  - hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less,
  - carbon monoxide (CO) content of 10 ppm or less,
  - carbon dioxide (CO2) content of 1000 ppm or less, and
  - no noticeable odor.

- Cylinders for Breathing Air. Cylinders used to supply breathing air must:

  - be tested and maintained as prescribed in the Department of Transportation (DOT) 49 CFR 180, Continuing Qualification and Maintenance of Packagings,
  - have a certificate of analysis from the supplier that the breathing air meets Grade D requirements,
  - not exceed a dew point of −50°F at 1 atmosphere
  - pressure, and

- have been hydrostatically tested and maintained according to DOT 49 CFR 173 Shipments and Packagings, 49 CFR 178 Specifications for Packagings, and must have been marked according to 42 CFR 84.

- Compressor Requirements for Supplied Breathing Air. Compressors used to supply breathing air shall be constructed and situated to meet the following requirements:

  - contaminated air cannot enter the air-supply system,
  - the dew point at 1 atmosphere pressure is 10°F (5.56°C) below the ambient temperature,
  - have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality,
  - a tag showing the date of the most recent change signed by the person authorized to perform the change,
  - compressors, hoses, vortex heaters/coolers, connectors, filters, and valves are restricted to this use only and stored properly to prevent contamination with dusts, mists, vapors, fumes, toxic gases, heat, and intense light,
  - prevent the use of couplings or make them incompatible so they cannot attach to non-respirable worksite air or other gas systems,
  - for compressors that are not oil-lubricated, ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm, and
  - for oil-lubricated compressors, use either or both a high- temperature or carbon monoxide alarm to monitor carbon monoxide levels (if using only high-temperature alarms, monitor the air supply at intervals to prevent carbon monoxide in the breathing air from exceeding 10 ppm).

b. Respirator Types and Entries into an IDLH Atmosphere

The atmosphere will be considered IDLH when any of the following conditions apply:

- a JHA is not complete and employees will wear respirators for the job task,
- contaminant concentration has not been measured or estimated with confidence,
- atmospheric contaminant exceeds an established IDLH concentration, or
- the atmosphere is oxygen deficient.

For oxygen-deficient atmospheres, if it can be demonstrated that under all foreseeable conditions the oxygen concentration can be maintained within the ranges specified in 29 CFR 1910.134(d)(3)(iv)(C), Table II, “Assigned Protection Factors,” then any atmosphere-supplying respirator may be used.

- Types of Respirators for IDLH Conditions. A full-face pressure demand SCBA, certified by NIOSH, with a minimum service life of 30 minutes or a combination full-face pressure

demand SAR, with an auxiliary self-contained air supply, shall be used in IDLH situations.

- Requirements for Entry into an IDLH Environment. Any entries into an IDLH environment shall adhere to the following requirements:

    - the PC shall be notified and provide assistance before any trained employee(s) enter the IDLH atmosphere to provide emergency rescue,
    - one or more employees shall be located outside the IDLH atmosphere that are trained and equipped with either (1) a pressure demand or other positive pressure SCBA or (2) pressure demand or other positive pressure SAR with auxiliary SCBA and emergency rescue equipment, and
    - voice or visual communication shall be maintained between the employee in the IDLH atmosphere and the employee(s) outside the IDLH atmosphere.

c. Medical Evaluation

Before using a respirator, employees must be medically evaluated by a PLHCP using 29 CFR 1910.134, Appendix C to determine the employee's ability to wear a respirator. The following information shall be provided to the PLHCP before the evaluation:

- type and weight of respirators to be used,
- duration and frequency of use,
- expected physical effort during use,
- expected additional PPE,
- expected temperature and humidity to be encountered, and
- anticipated workplace hazards and potential exposures.

    - PLHCP-Provided Information. The PLHCP must provide the following information about the employee's ability to use a respirator:

        - whether the employee is medically able to use a respirator,
        - any limitations related to an employee's medical condition or the workplace where the respirator will be used,
        - whether there is a need for a follow-up medical evaluation, and
        - any recommendations provided to the employee.

    - Additional PLHCP Determination of Respirator Use. If the PLHCP finds a medical condition that may place the employee's health at increased risk if a negative pressure respirator is used, then a powered air purifying respirator (PAPR) shall be provided. If a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then a PAPR is no longer required.
    - Additional Medical Evaluations Not Specified by the PLHCP. An additional medical evaluation or consultation must be coordinated with Human Resources, per

Reclamation Manual Directives and Standards HRM 02-01 Qualification Requirements (Medical), and provided in the following circumstances:

- an employee requires an explanation or consultation regarding the evaluation results or reports medical signs or symptoms related to their ability to use a respirator,
- workplace conditions or expectations change and substantially increase the employee's physiological burden, and
- a PLHCP, supervisor, or PC determines the need for an additional evaluation (e.g., observations made during fit tests and program evaluation).

d. Fit Testing

Before first use, and annually thereafter, employees shall be fit tested with the type, size, and model of respirator they will use. A loose-fitting respirator (e.g., PAPR) does not require a fit test. Fit testing shall be conducted using an OSHA-accepted quantitative fit test (QNFT) protocol according to the requirements in the following paragraphs. The OSHA-accepted QNFT protocols and procedures are contained in 29 CFR 1910.134, Appendix A, Part I C: Quantitative Fit Test (QNFT) Protocols.

- QNFT. QNFT shall be used to fit test all respirators. QNFT for full-facepiece respirators shall meet, or exceed, a fit factor of 500, and half-mask respirators shall meet, or exceed, a fit factor of 100.
- Tight-Fitting Positive Pressure SAR and PAPR. Fit testing for these types of respirators can be done using QNFT protocol in negative pressure mode regardless of whether the respirator is used in the negative or positive pressure mode.
- Retesting. Fit testing is required annually or whenever the following occurs:
  - the employee requests testing,
  - a change in the employee's physical condition that affects facepiece fit (e.g., significant weight loss/gain, dental work),
  - use of a different facepiece configuration is require, and/or
  - OSHA standards require more frequent testing.

e. Respirator Use

Employee's wearing a tight-fitting facepiece shall not wear their respirators under the following conditions:

- any physical condition, facial hair, corrective glasses, goggles, or other PPE interferes with the seal of the facepiece or valve function, and
- the employee reports medical signs or symptoms that are related to their ability to use a respirator.

f. Respirator Maintenance, Care, and Inspection

- Respirator Cleaning.
    - Respirators are cleaned, disinfected, and maintained in a sanitary condition, according to the manufacturer's instructions and the procedures outlined in 29 CFR 1910.134, Appendix B-2, Respirator Cleaning Procedures (Mandatory); and
    - Respirators for emergency use, fit testing, and training are cleaned and disinfected after each use.

- Respirator Inspection. Employees who routinely use respirators shall inspect before each use and during cleaning. The inspection shall include the following checks:
    - filtering parts (for pliability and deterioration),
    - respirator function and tightness of connections, and
    - the condition of various parts, including but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, or filters.

- Respirator Repairs. Respirators that fail inspection or are found to be defective shall be removed from service. These respirators shall be discarded, repaired, or adjusted in accordance with the manufacturer's recommendations and specifications for the type and extent of repairs performed. Only the respirator manufacturer's NIOSH-approved parts shall be used in repairs.

g. Voluntary Use of Respirators

When an employee requests to voluntarily use a respirator, the following conditions must be met: (1) there is not an atmospheric hazard that would require respiratory protection, (2) use of the respirator will not create a hazard, and (3) respirator use is not required by the PC or by a specific OSHA regulation.

- Voluntary Use Requirements for a Filtering Facepiece. Employees may voluntarily use filtering facepieces for protection from nuisance dusts, mists, fumes, smoke, pollen, and other particulates. The PC and IH must document that no respiratory hazard exists, and the employees have been trained according to section 2.08.4 Training.
    - Voluntary Use Form. Before using the filtering facepiece, the employee must submit a written voluntary use request to their supervisor and the PC. Regions shall develop their own form that documents:
        - use is voluntary,
        - a JHA that assesses any perceived hazard(s),
        - whether it is possible to introduce hazards by wearing the filtering facepiece, and
        - that employee has received 29 CFR 1910.134, Appendix D.

  - Training. Basic training on respirators, in 29 CFR 1910.134(k) "Training and information", and a copy of 29 CFR 1910.134, Appendix D, shall be provided to all voluntary users. Training shall be documented in the DOI official repository.
  - Fit Testing and Medical Evaluation. The use of filtering facepieces that meet the requirements in paragraphs 2.08.6.g.(1) Voluntary Use Requirements for a Filtering Facepiece and are used voluntarily do not require fit testing or medical evaluations.

- Voluntary Use Requirements for Respirators Other Than a Filtering Facepiece. Before using the respirator, the employee must submit a written voluntary use request to their supervisor and PC along with a JHA that assesses any perceived hazard(s) and considers whether it is possible to introduce hazards by wearing the respirator.

  - Voluntary Use Form Regions shall develop their own form that documents:

    - respirator use will not create a hazard,
    - how respirators are properly cleaned, stored, and maintained to not present a health hazard,
    - the employee receives and passes a medical evaluation, paragraph 2.08.6.c Medical Evaluation, and is medically qualified to wear respirators and a fit test, paragraph
    - 2.08.6.d Fit Testing, with the requested respirator type and model,
    - the employee has received 29 CFR 1910.134, Appendix D, and is trained in the program elements of the RPP, and
    - medical evaluations, fit testing, and training are documented in the DOI official repository.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 2.09 Bloodborne Pathogens

1. Scope

This section establishes the safety requirements, guidelines, and precautions for personnel who may come in to contact with human blood products and possible occupational exposure to bloodborne pathogens (BBP).

2. General Requirements

The Occupational Safety and Health Administration (OSHA) 1910.1030, Bloodborne Pathogens regulates occupational exposure to blood, body fluids, or other potentially infectious materials (OPIM).

3. Responsibilities

a. Area Office Managers

- Shall designate, in writing, the program coordinator (PC) for BBP.

b. Program Coordinators and Local Safety Professionals

- Shall be trained in BBP to fulfill the requirements of this section.
- Shall identify job classifications and tasks with risk of occupational exposure to blood, body fluids, or OPIM.
- Shall initially develop and annually review and update the Exposure Control Plan (ECP).
- Shall coordinate initial training for tasks with occupational exposure, annually thereafter, and when changes in tasks or procedures occur.
- Shall verify biohazard waste containers meet applicable requirements and coordinate the pick-up and disposal of all regulated waste.
- Shall regularly schedule reviews of existing engineering controls for adequacy and investigate new engineering controls as necessary.
- Shall submit all required medical documentation (per paragraph 2.09.4.c) for retention in the exposed employees' personnel file.
- Shall provide employees with potential or confirmed exposure to BBP guidance to obtain necessary vaccinations and exposure follow up.
- Shall provide first-line supervisors with recommendations for selection and purchase of BBP kits, Personal Protective Equipment (PPE), and supplies for all workers who are occupationally exposed.

c. First-Line Supervisors

- Shall ensure all affected employees complete required training (paragraph 2.09.4).
- Shall provide PPE to employees and provide training on the use of required PPE.

- Shall ensure employees follow the ECP.
- Shall immediately notify the PC when an employee has contact with blood, body fluids, or OPIM.
- Shall restock BBP kits as needed.
- Shall enter all BBP exposures into the Safety Management Information System (SMIS).
- Shall review BBP exposure reports from their employees in SMIS.
- Shall ensure clean and sanitary worksites per the ECP.

d. Employees

- Shall complete BBP training prior to participating in tasks which have or may have occupational exposure.
- Shall wear PPE required by the ECP for occupational exposure tasks or procedures.
- Shall immediately notify the first-line supervisor of contact with blood, body fluids, or OPIM.
- Shall complete exposure incident documentation after contact with blood, body fluids, or OPIM (paragraph 2.09.7.e).
- Shall enter all BBP exposures in SMIS.

4. Training Requirements

a. Initial

- Employees with Occupational Exposure. Initial training for employees with occupational exposure must include the following:

    - 29 CFR 1910.1030 bloodborne pathogen standard,
    - bloodborne diseases and their transmissions (a general discussion),
    - ECP,
    - engineering and work practice controls,
    - PPE,
    - Hepatitis B virus (HBV) and vaccination,
    - Hepatitis C virus (HCV),
    - response to emergencies involving blood,
    - how to handle exposure incidents,
    - proper handling and disposal methods of infectious waste,
    - post-exposure evaluation and follow-up program, and
    - biohazard labels and waste containers.

b. Refresher/Recertification

Employees with occupational exposure must complete annual refresher training and when changes contribute to the employee's occupational exposure, such as administrative or work practice controls and/or modification of tasks or procedures.

c. Recordkeeping

- Medical Records. The PC or local safety professional shall submit any medical record documentation to the official Department of the Interior (Department) personnel repository and retain all incident exposure records for the duration of employment plus 30 years after separation. The PC or local safety professional shall also submit records of HBV vaccination status (including dates), declination forms, results of any examinations, a copy of the health care professional's written opinion, and a copy of information provided to the health care professionals.
- Training Records. Reclamation training records shall be kept in the DOI official repository. Training records must include dates, contents of the training program or a summary, trainer's name and qualifications, and the names and job titles of all people attending.
- Sharps Injury Log. The PC or local safety professional must maintain a sharps injury log for percutaneous injuries from contaminated sharps and record incidents in the log in such a manner as to protect the confidentiality of the injured employee. The log must contain the type and brand of device, the department or work area where the exposure incident occurred, and an explanation of how the incident occurred. First-line supervisors must report sharps injuries in the SMIS.
- Safety Management Information System Reporting. First-line supervisors must report BBP exposures and sharps injuries in the SMIS. If the exposure is infectious, the first-line supervisor must report through the SMIS injury reporting process. If the exposure is unknown, then the first-line supervisor must report using the SMIS exposure module.

5. Hazard Identification, Assessment, and Safety Measures

a. Exposure Determination

The PC shall complete an exposure determination, which includes lists of all job classifications and specific tasks and procedures with confirmed and possible occupational exposure. The PC must make an exposure determination without regard to PPE.

b. Exposure Control Plan

The PC shall develop and implement an ECP for employees with confirmed and possible occupational exposure. The plan must be accessible to all affected employees. The ECP must include:

- exposure determination based on the tasks, procedures, and job classifications,
- schedule and methods of compliance (universal precautions, work practices, and/or engineering controls),
- procedures for cleanup of contaminated areas and materials,
- procedures for evaluating circumstances surrounding exposure incidents,
- HBV vaccination, post-exposure, and follow-up evaluations,

- communication of hazards to employees, and
- recordkeeping.

The PC shall review and update the plan at least annually to reflect changes in technology which reduce or eliminate exposure to BBP. Updates must include consideration and implementation of commercially available and safer medical devices designed to eliminate or minimize occupational exposure.

6. Personal Protective Equipment

First-line supervisors shall provide PPE to employees and train them on the use of required PPE to eliminate or minimize the risk of infectious material entering employees' bodies. PPE must prohibit blood, body fluids, and OPIM from contacting non-intact skin, eyes, mouth, or other mucous membranes or respiratory system under normal conditions of use.

a. Gloves

Employees shall wear hand protection (e.g., disposable (single use) gloves) whenever contact with blood, body fluids, or OPIM is possible.

b. Masks, Eye Protection, and Face Shields

Employees shall use a combination of masks, eye protection, and face shields whenever splashes, spray, or droplets of infectious materials can occur.

c. Gowns, Aprons, and Other Protection Clothing

Employees shall wear gowns, aprons, and other protective clothing when splashing of blood, body fluids, or OPIM fluids is possible.

d. Resuscitation Equipment

Employees shall use cardiopulmonary resuscitation mouthpieces, pocket masks, resuscitation bags, or other ventilation equipment to eliminate direct mouth-to-mouth contact.

e. Contamination

Employees shall not wear PPE if it has lost its effectiveness for protecting employees from BBP hazards. First-line supervisors must replace PPE at no cost to the employee. Employees shall remove all potentially contaminated PPE prior to leaving the work area or accident/incident site and place it in a biohazard waste container for disposal or decontamination.

7. Safe Practices

a. Universal Precautions

All employees must use universal precautions when any contact with blood, body fluids, or OPIM is possible. All employees must treat human blood, body fluids, and OPIM as if they are infectious for HBV, HCV, human immuno-deficiency virus (HIV), and other BBPs. Employees

must consider all body fluids infectious in situations where it is difficult or impossible to differentiate between types. Employees shall use the following methods to eliminate and reduce risk for transmission of BBP:

- wash hands frequently and use disposable garments,
- select gloves for the hazards of a specific job,
- avoid spray or splash of body fluids, and
- label and package contaminated wastes properly.

b. Handling Contaminated Sharps

Users shall immediately discard contaminated sharps in a closable, puncture-resistant, leakproof, and properly labeled container. Contaminated sharps containers must be easily accessible, upright, and near sharps use locations. Employees handling contaminated sharps must not press down, smash, step on, or otherwise compress any regulated waste containers.

c. Cleanup of Contaminated Areas.

Employees shall use engineering controls and PPE when disinfecting contaminated areas. Clean up methods must prevent physical injury from direct handling of broken glass, needles, or other sharps. Employees must not bend, recap, or remove contaminated needles and sharps. Employees are prohibited from shearing or breaking of contaminated needles or sharps. Employees most dispose of sharps and infectious waste in a puncture- resistant container for disposal. Only approved contractors may dispose of regulated waste in accordance with Federal and local regulations. Employees must use Environmental Protection Agency-registered disinfectants for HIV and HBV contaminated surfaces.

d. Methods of Compliance

Universal precautions and engineering controls aid in eliminating or minimizing BBP exposure.

- Engineering Controls and Work Practices. Engineering controls are the primary means of eliminating or minimizing employee exposure, isolating, or removing BBP hazards from the work environment.
- Housekeeping. In the ECP, the PC shall include a schedule and method for cleaning and decontamination based on the location within the facility, surfaces, waste to clean, and tasks or procedures performed in that location. First-line supervisors shall ensure clean and sanitary worksites per the ECP.
- Specific Requirements for Contaminated Work Surfaces. If an incident occurs, employees must block off access to the area until the decontamination is complete. Immediately, or as soon as feasible, employees must clean and decontaminate work surfaces when blood, body fluids, or OPIM is present. Employees must dispose of all contaminated cleaning materials and PPE in biohazard waste containers.
- Laundry. Employees shall remove and dispose of contaminated clothing as soon as possible. Employees shall clean contaminated fire-rated and arc-rated clothing following

manufacturer's instructions. If these instructions are not available, consult the local safety professional for guidance.

- Regulated Wastes/Medical Wastes. Employees must separate regulated and medical wastes from other wastes at the point of origin and dispose of according to Federal, state, and local regulations. Examples of regulated wastes include used needles, disposable resuscitators, used bandages, and contaminated PPE.
- Biohazard Waste Containers and Labels. The PC or local safety professional shall verify biohazard waste containers and labels meet the specific requirements of 29 CFR 1910.1030(d)(4)(iii). Labels will be fluorescent orange or orange red with lettering and symbols in a contrasting color. Red bags or containers are acceptable substitutes for labels. Warning labels shall be present on regulated waste containers. Labels shall meet the specific requirements of 29 CFR 1910.1030(g)(1)(i).

e. Exposure Incident Documentation

Employees shall report all exposure incidents involving the presence of blood, body fluids, or OPIM to their first-line supervisor and local safety professional as soon as possible. The first-line supervisor must record the incident in the SMIS.

- Potential Exposure. The local safety professional must make the HBV vaccination series available as soon as possible, but not later than 24 hours after an exposure incident, to all unvaccinated workers that assist in situations with blood, body fluids, or OPIM regardless of whether a specific exposure incident occurred.
- No Cost to the Employee. The PC or local safety professional must make all medical evaluations and procedures including the HBV vaccine, vaccination series, prophylaxis, and post-exposure evaluations and follow-ups available at a reasonable time and place; performed by, or under the supervision of, a licensed physician or other licensed health care professional; and at no cost to the employee.
- Follow-up. Following a potential exposure incident, the local safety professional shall coordinate a confidential medical evaluation and follow-up.

    - Source Individual. The local safety professional must obtain consent to test the source individual's blood as soon as feasible to determine HBV, HCV, and HIV infectivity. If the local safety professional is unable to obtain consent, Reclamation shall establish that legally required consent cannot be obtained.
    - Results. The local safety professional must inform the exposed employee about disclosure laws and regulations concerning the identity and infectious status of the source individual and provide the results of the source individual's testing to the exposed employee. If the employee consents to baseline blood collection, but does not consent to HIV testing, the local safety professional shall ensure the sample is preserved for at least 90 days. The employee has the right to change consent within the 90-day time frame of HIV testing.

f. HBV Vaccination and Post-Exposure Evaluation Follow-Up

The PC or local safety professional shall ensure the HBV vaccination series is available to employees with occupational exposure and to employees who have had an exposure incident. The PC or local safety professional will also ensure post-exposure evaluations and follow-ups are made available.

g. HBV Vaccination

Reclamation provides the vaccination at no cost to employees with occupational exposure within 10 working days of initial assignment. If the employee initially declines the vaccination, they can later decide to accept the vaccination. Any employee who declines the vaccination must sign a declination form, which human resources will retain in the employee's medical file. 29 CFR 1910.1030, Appendix A, Hepatitis B Vaccine Declination (Mandatory) contains the declination form. Reclamation also provides all boosters at no cost to the employee.

h. Post-Exposure Evaluation and Follow-Up

Following an exposure incident, the local safety professional shall immediately make a confidential medical evaluation available to the exposed employee and shall carry out the following process:

- Document the route of exposure and circumstances under which the exposure occurred.
- Identify and document the source individual, unless the employer can establish that identification is infeasible or prohibited by law.
- Test the source individual's blood as soon as feasible to determine HBV and HIV infectivity if the local safety professional is able to obtain consent. If unable to obtain consent, the local safety professional shall establish that legally required consent cannot be obtained. When the source individual's blood is available, it shall be tested, and the results documented.
- When the source individual already has a known infection with HBV or HIV, the local safety professional need not repeat the test.
- The local safety professional will make the results of the source individual's testing available to the exposed employee and shall inform the employee of applicable laws and regulations concerning disclosure of the identity and infectious status of the source.
- Reclamation shall offer counseling at no cost to the employee.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 3.01 Materials Handling, Storage, and Disposal

1. Scope

This section sets forth the program requirements for safe materials handling including storage for construction materials and hazardous materials. This section applies to all Bureau of Reclamation employees within all facilities owned, controlled, and occupied by Reclamation.

2. General Requirements

a. Storage

Storage of materials shall not create a hazard. Ensure materials stored in tiers are blocked, interlocked, and limited in height so they are stable and secure against falling, sliding, or collapse. Store all materials on pallets to discourage rodent infestation, and immediately clean up spills and leaks that create rodent habitat. When using slings to hoist bagged materials, lumber, bricks, masonry blocks, and similar loosely stacked materials, ensure the slings have been inspected prior to use and the materials and loads are fully secured against falling by straps, sideboards, nets, or other suitable devices. See Reclamation Safety and Health Standard (RSHS) Section 3.02, Slings and Rigging Hardware, and RSHS Section 3.03, Permanently Installed (Fixed) Cranes and RSHS Section 3.04, Mobile Cranes for additional information on rigging and hoisting operations.

b. Worker Safety

Workers shall be observed annually during manual material handling tasks to evaluate the following ergonomic risk factors. Evaluation methods include, but are not limited to, National Institute of Occupational Safety and Health (NIOSH) Lifting Equation, Rapid Upper Limb Assessment (RULA), and Rapid Entire Body Assessment (REBA).

- Exerting excessive force while lifting heavy objects, pushing or pulling heavy loads, manually pouring materials, or maintaining control of equipment or tools.
- Performing the same motion(s) continually and/or frequently for an extended period.
- Working in awkward postures or holding a specific posture for long periods of time, such as repeatedly lifting above shoulder level, kneeling/squatting, or twisting while lifting.
- Absorbing vibration in the whole body or hand/arm from power tools such as portable grinders, sanders, and chainsaws.

c. Lifting

Mechanical handling aids must be used when lifting materials heavier than 50 pounds or awkwardly shaped items that are impractical for one person to lift themselves. If mechanical handling aids are not feasible, then get help from additional workers before lifting such heavy or awkward items.

d. Equipment

Ensure that equipment is working properly to make it easier to use. Workers should not suffer bodily discomfort from performing job tasks or using equipment. Such discomfort may be observed in workers via bodily signs, such as shaking of the arms or hands or rolling of the shoulders, or via personal mitigation efforts, such as bringing wrist braces or back belts into work.

3. Responsibilities

a. Regional Safety Managers

- Shall provide regional oversight and assistance to implement program for safe material handling, storage, and disposal compliance within their region.

b. Regional/Area Office Program Coordinators

- Shall annually observe workers in coordination with the first-line supervisor and/or the industrial hygienist or other appropriate safety professional to evaluate ergonomic risk factors as outlined in RSHS Section 3.01.2.b, Worker Safety.

c. Area Office Managers

- Shall ensure all affected employees are trained on and comply with this program.
- Shall provide necessary resources to implement and maintain the procedures in this program.
- Shall select the program coordinator.

d. First-Line Supervisors

- Shall periodically observe their employees to ensure the requirements of this section are met.
- Shall coordinate training for their employees before they are exposed to job hazards and ensure all relevant training is provided for materials present in the workplace.
- Shall update the job hazard analysis (JHA) when hazardous materials, heavy items, and equipment are introduced to the workplace.
- Shall ensure employees are trained in the use of required or provided personal protective equipment (PPE).
- Shall provide employees with appropriate PPE for the level of hazards they may be exposed to.

e. People Doing the Work

- Shall participate in required training programs, including but not limited to training on hazard communication and mobile equipment used to handle materials.
- Shall apply general safety principles, such as proper work practice, inspection and controls in their work.
- Shall maintain general housekeeping.

- Shall use PPE that is adequate to protect against identified workplace hazards.
- Shall perform material handling operations and operate materials handling equipment safely to prevent injury or damage.
- Shall immediately report any unsafe material handling, storage, or disposal to their supervisor.

4. Training Requirements

a. Initial

Hazard communication training is required for all employees that use, handle, store, and dispose of hazardous materials. Relevant training shall be provided for the materials any incidental employee who may be exposed to or will handle, store, or dispose of hazardous materials is also required. Hazard communication training is required for employees who order or purchase hazardous materials.

b. Injury Prevention Training

Employees shall receive injury prevention training that covers the following:

- risks of improper lifting,
- physical warning signals when the body is manually lifting or carrying materials improperly,
- use of mechanical moving equipment to avoid unnecessary physical stress or strains,
- use of lifting aids, and
- PPE.

c. Recordkeeping

Training records shall be maintained in the Department of the Interior's system of tracking training.

5. Hazard Identification, Assessment, and Safety Measures

a. Requirements

Workers who handle, store, or dispose of materials must observe the following:

- inspect materials for slivers, nails, or other protruding objects, jagged or sharp edges, burrs, and rough or slippery surfaces,
- maintain firm grip on objects,
- keep fingers away from pinch points,
- when handling lumber, pipe, or other long objects, keep hands away from the ends to prevent pinching,
- wipe off greasy, wet, slippery, or dirty objects before trying to handle or store them, and
- keep hands free of oil and grease.

b. Medical and First Aid

Adequate first aid shall be readily available. Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eye and body shall be provided within the work area for immediate use.

6. Personal Protective Equipment

Workers who handle, store, or dispose of materials must follow instructions for protective clothing and respiratory protection. Use gloves as specified in RSHS Section 1.07, Personal Protective Equipment, and safety data sheets (SDS). Skin protection including washing facilities, protective gloves, hand cream, chemical barrier cream, or similar protection shall be identified in the JHAs.

7. Safe Practices

a. Flammable Liquids

Unless otherwise defined, terms used throughout this section relating to flammable liquids have the same meaning as in the flammable liquids code established in National Fire Protection Association (NFPA) 30, Flammable and Combustible Liquids Code, and 29 CFR 1910.106. Flammable liquids are classified as shown in Table 3.01-1.

TABLE 3.01-1: Categories of Flammable Liquids

Category	Flash Point	Boiling Point
Category 1	Below 73.4°F (23°C)	Below 95°F (35°C)
Category 2	Below 73.4°F (23°C)	Above 95°F (35°C)
Category 3	At or above 73.4°F (23°C) and at or below 140°F (60°C)	-
Category 4	Above 140°F (60°C) and at or below 199.4°F (93°C)	-

- Toxicity of Flammable Liquids. Most flammable liquids are highly toxic. Use them only after determining the toxic characteristics to ensure that the appropriate safety and health requirements in RSHS 2.06, Health Hazard Assessments, are followed.
- Category 1 Flammable Liquids
    - Restricted Use. Because of the extreme explosion hazards posed by Category 1 liquids, SDSs must be reviewed for required storage, dispensing, and use procedures prior to purchasing Category 1 liquids. The following shall be reviewed: the name of the Category 1 flammable liquid, a description of the liquid and its characteristics, a detailed description of its intended uses, the SDS, and an

explanation of the safety and health precautions that must be taken to ensure safe handling and storage. This requirement does not apply to small quantities of aerosol starter fluid used for engines.

- Substitute Product. Whenever possible, use a less hazardous product.
- Controlled Use. A competent person must supervise storing, dispensing, and using Category 1 liquids, including design of the storage and dispensing system.

- Tanks and Containers. Use only closed tanks and containers designed to store, handle, and dispense flammable liquids. Store and use flammable liquids in the original shipping containers, provided they meet the specifications shown in Table 3.01-2.

Table 3.01-2: Maximum Allowable Size of Containers and Portable Tanks for Flammable Liquids

Container Type	Category 1	Category 2	Category 3	Category 4
Glass or approved plastic	1 pint	1 quart	1 gallon	1 gallon
Metal (other than approved DOT drums)	1 gallon	5 gallons	5 gallons	5 gallons
Safety cans	2 gallons	5 gallons	5 gallons	5 gallons
Metal drums (DOT specification)	60 gallons	60 gallons	60 gallons	60 gallons
Approved portable tanks	660 gallons	660 gallons	660 gallons	660 gallons

- Safety Cans. When dispensing flammable liquids from storage containers, dispense them into approved, properly labeled safety containers. At industrial sites, an approved container holds no more than 5 gallons, has a spring closing lid and spout cover, and is designed to safely relieve internal pressure when subject to fire or heat. At construction sites, an approved container is a safety can or other Department of Transportation (DOT) approved container of 5 gallons or less.
- Exceptions. Highly viscous (i.e., extremely hard to pour) liquids may be stored and handled in the original container regardless of size.
- Flammable Liquid Storage Cabinets. The design and construction of flammable liquids storage cabinets shall meet the requirements of Occupational and Health Administration (OSHA) 29 CFR 1910.106, Flammable Liquids.

b. Storing Flammable Liquid

- Indoor Storage. Do not store flammable liquids indoors, except under the following conditions.

- Incidental Storage. The quantity of liquid that may be located outside of a separated indoor storage room or storage cabinet in a building or in any one fire area of a building shall not exceed: 25 gallons of Category 1 flammable liquids in containers, 120 gallons of Category 2, 3, or 4 flammable liquids in containers, and 660 gallons of Category 2, 3, or 4 flammable liquids in a single portable tank.
- Storage Limits. Store no more than 60 gallons of Category 1, 2, or 3 flammable liquids nor more than 120 gallons of Category 4 flammable liquids in a storage cabinet. Locate no more than three such cabinets in a single fire area.
- Separated Indoor Storage Rooms. Larger quantities of flammable liquids may be stored in separated indoor storage rooms when such design, construction, and storage meet the requirements of 29 CFR 1910.106 and NFPA 30.
- Required Fire Extinguishers. Place at least one 2-A:40-B:C fire extinguisher inside the room between 10 and 30 feet away from the stored material or cabinet. Also place at least one 2-A:40-B:C fire extinguisher outside of but not more than 10 feet from the door opening into an inside liquid storage area.

- Outdoor Storage. Do not store flammable liquids outdoors, except under the following conditions.

  - Approved Containers. Store flammable liquids above ground in approved containers with a capacity of no more than 60 gallons. Such containers are subject to the following restrictions:

    - The total capacity of any one group of containers stored together must not exceed 1,100 gallons,
    - Each group of containers must be at least 5 feet apart, and each group must be at least 20 feet away from any building or other combustible items, and
    - Each group of containers must be adjacent to an access way at least 12 feet wide to facilitate the use of firefighting equipment.

  - Approved Portable Tanks. Store flammable liquids above ground in approved portable tanks with a capacity no more than 660 gallons. Such portable tanks are subject to the following requirements:

    - groups of two or more tanks with a combined capacity of more than 2,200 gallons must be surrounded by a clearance area of at least 5 feet,
    - portable tanks must be at least 20 feet away from any building or other combustible items,
    - portable storage tanks must be equipped with emergency venting and other devices, as required by 29 CFR 1910.106 and NFPA 30,
    - each portable tank must be adjacent to an access way at least 12 feet wide to facilitate the use of firefighting equipment, and

        - place at least one portable fire extinguisher rated no less than 2-A:40-B:C between 25 and 75 feet away from each portable tank or group of tanks.

    - Spill Containment. The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures or shall be surrounded by a curb at least 6 inches high. When curbs are used, provisions shall be made for draining of accumulations of ground or rainwater or spills of flammable liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

- Outdoor Permanent Tanks. Store flammable liquids above ground in approved permanent tanks installed in accordance with 29 CFR 1910.106 and NFPA 30.

c. Handling and Dispensing Flammable Liquids

- Dispensing Areas. Dispensing areas must be separate from storage areas if more than 5 gallons of flammable liquids will be transferred. Dispensing areas must be separated from other operations by at least 25 feet or by a partition with a minimum 1-hour fire rating and must use drainage or an equally effective method to contain spills.
- Ventilation. Dispensing areas must provide adequate natural or mechanical ventilation to keep the concentrations of flammable vapor below 10 percent of the lower explosive limit.
- Grounding and Bonding. When transferring flammable liquids from one container to another, electrically ground and bond all containers and transfer systems. All dispensing systems must be electrically grounded and bonded.
- Dispensing. Flammable liquids must be withdrawn from or transferred into vessels, containers, or tanks according to the following requirements:

    - always transfer through a closed piping system,
    - always transfer from a safety can by means of a device drawing through the top,
    - always transfer from containers or tanks by gravity or self-closing valve pump,
    - always use approved dispensing devices and nozzles,
    - always protect the dispensing unit against collision damage, and
    - never transfer by injecting pressurized air into a tank or container.

- Lighting and Electrical Equipment. Use only hazardous location classified electrical lighting to illuminate areas where flammable liquids are handled or dispensed or where flammable vapor may be present. Wiring and all electrical equipment must meet hazardous location classification of Class I, Division 1 or 2 as required by NFPA 70, National Electrical Code.
- Flame and Ignition. Do not permit open flames, smoking, or other sources of ignition within at least 50 feet of areas where flammable liquids are dispensed or used. Approved “No Smoking” signs must be posted in such areas.

- Leakage or Spillage. Leaking and spilled flammable liquids must be cleaned up promptly and disposed of safely.
- Self-Closing Oily Waste Cans. Self-closing oily waste cans shall be provided in all areas where employees use or dispense flammable liquids.

d. Handling Liquified Petroleum Gas (LPG)

Store, handle, install, and use LPG in accordance with NFPA 58, Liquefied Petroleum Gas Code and 29 CFR 1910.110, Storage and Handling of Liquefied Petroleum Gas. Cylinders must meet DOT specifications published in 49 CFR 178, Specifications for Packagings.

- Hazardous Locations. Do not use LPG containers and equipment in unventilated spaces, below grade in pits or trenches, below deck on watercraft, or in confined space.
- Tubing. Use only tubing or piping approved for use in LPG systems. Do not use aluminum or polyvinyl piping or tubing.
- Hoses. Use only hoses labeled “LP-gas” or “LPG.” Hoses must have a minimum working pressure of 250 pounds per square inch.
- Valves and Accessories. Valves (including shutoff valves), fittings, and accessories connected directly to an LPG container must have a minimum working gauge pressure of 250 pounds per square inch and be designed for LPG.
- Shutoff Valves. Connections to an LPG container (except safety relief connections, liquid level gauging devices, and unplugged openings) must have a shutoff valve located as close to the container as practicable. Shutoff valves must not be located between the safety relief device and the container.
- Safety Relief Valves. Equip each LPG container with one or more approved safety relief valves. Valves must allow free venting to the outside air, and the discharge must be at least 5 feet away from any building opening. The regulator safety relief valve (vent opening) shall be located not less than 5 feet from any potential source of ignition, opening into any sealed combustion chamber appliance, and be less than 5 feet from any mechanical ventilation air intake. Regulators are mechanical devices and are subject to wear and tear.
- Dispensing
    - Portable Containers. Fill portable containers from storage containers outside and at least 50 feet away from the nearest building.
    - Motor Vehicles. Fill fuel containers on motor vehicles from storage containers at least 10 feet away from masonry-walled buildings and at least 25 feet away from any other type of building or structure.
    - Refueling. Shut down equipment using LPG during refueling.
- Storage of Cylinders and Containers. Store LPG containers and cylinders that are not in use outside of buildings or structures and away from the nearest building or combustible material storage. Minimum safe distances are listed in Table 3.01-3.

TALBE 3.01-3 Minimum Safe Storage Distance of Liquified Petroleum Gas

Water capacity per container	Containers Underground	Containers Above Ground	Between above-ground Containers
Less than 125 gallons[1]	10 feet	none	none
125-250 gallons	10 feet	10 feet	None
251-500 gallons	10 feet	10 feet	3 feet
501-2,000 gallons	25 feet[2]	25 feet[3]	3 feet
2,001-30,000 gallons	50 feet	50 feet	5 feet
30,001-70,000 gallons	50 feet	75 feet[3]	-
70,001-90,000 gallons	50 feet	100 feet[3]	-

- Fire Protection. Place at least one portable fire extinguisher rated not less than 2-A:40-B:C between 25 feet and 75 feet away from the container in all LPG storage locations.

e. Refueling Vehicles and Equipment

Ensure that the design and installation of tanks and equipment used to refuel vehicles or equipment comply with provisions of one of the following: nationally recognized testing laboratories or approval of the government authority having jurisdiction.

- Dispensing Stations. Mount dispensing devices (except those attached to containers) on a concrete platform elevated at least 5 inches above grade. Use guardrails or posts to protect the dispensing device from collision with motor vehicles.
- Dispensing Hose. Dispense flammable liquids using only approved hose. The hose must include an automatic self-closing valve or nozzle system to protect hose from damage.
- Electrical Equipment. Ensure that electrical wiring, pumps, and other equipment meet the requirements of NFPA designation Class I of NFPA 70, National Electrical Code.
- Shutoff During Refueling. During refueling, shut down vehicles or equipment that use gasoline, LPG, or any other flammable liquid fuels.

[1] If the aggregate water capacity of a multi-container installation at a consumer site is 501 gallons or greater, the minimum distance shall comply with the appropriate portion of this table, applying the aggregate capacity rather than the capacity per container. If more than one installation is made, each installation shall be separated from another installation by at least 25 feet. Do not apply the MINIMUM DISTANCE BETWEEN ABOVE-GROUND CONTAINERS to such installations.

[2] The above distance requirements may be reduced to not less than 10 feet for a single container of 1,200 gallons water capacity or less, providing such a container is at least 25 feet from any other LP-Gas container of more than 125 gallons water capacity.

[3] ¼ of sum diameters of adjacent containers.

- Smoking. Post “No Smoking within 50 feet” signs on all mobile refueling equipment and within established refueling areas.
- Emergency Shutoff Switch. Ensure that an emergency shutoff switch is located within 50 feet of the fuel dispensing equipment. Conspicuous signs must be posted to identify the switch location.
- Fire Protection. Place one or more listed fire extinguishers with a minimum classification of 2-A:40-B:C in each refueling area. Fire extinguishers must be within 100 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service room.

f. Handling Asphalt and Tar Products

Employees who handle or work with asphalt and tar products must complete a JHA that includes exposure determinations. SDSs must be available and all instructions to store, handle, and apply materials must be followed.

- Confined Spaces. Employees who handle or work in an enclosed or confined area where tar, asphalt, enamel, or similar materials are heated or applied must follow the requirements of RSHS 1.12, Confined Spaces.
- Heating Kettles. Kettles for heating asphalt or tar must meet and be used in accordance with the following requirements:

    - asphalt or tar kettles must not be left unattended when in use,
    - kettles must be used on a firm, level base and must be protected from overturning,
    - kettles must have effective lids or hoods,
    - kettles must have an operable temperature indicator and limiting device to ensure that asphalt or tar remains at no less than 50°F below the flashpoint,
    - kettles must not be used in confined or unventilated spaces nor within or on enclosed buildings and structures, and
    - place a fire extinguisher rated no less than 2-A:40-B:C wherever heating devices or heating kettles are in use.

- Handling. Provide adequate unobstructed runways or access ways for employees handling hot materials. Hot materials must not be carried up or down ladders. Suitable hoisting devices must be provided.
- Thinners. Do not use gasoline or similar volatile liquids as thinners.
- Hand Spraying. Persons applying hot tar or asphalt must not work under the hose supplying the material to the spray nozzle. Use flexible metallic hoses fitted with insulated handles for hand spraying operations.
- Housekeeping. Keep distributors, hoses, and related equipment reasonably free of asphalt and tar accumulations.

g. Storing and Handling Paints, Varnishes, and Thinners

Storing and handling paints, varnishes, or thinners requires attention to flammability characteristics.

- Storage. Store and dispense paints, varnishes, lacquers, thinners, and other volatile paints or coatings according to their flammability characteristics as stated within SDS. Containers shall be tightly closed when not in use. Store no more than a 1-day supply in buildings under construction.
- Ventilation. Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit where paints or coatings are dispensed and/or applied.
- Spray Painting. Do not allow smoking, open flames, exposed heating elements, or other sources of ignition where flammable sprays paints and/or coatings are used. Spray painting booths and equipment must comply with NFPA 30, Flammable and Combustible Liquids Code.
- Electrostatic Paint Spraying
    - Electrical Safety. Locate transformers, power packs, control apparatus, other electrical portions of the equipment, and the equipment's connection to the power supply outside the spray area.
    - Grounding and Bonding. Ground and bond the handle of the spray gun with a conductive device to ensure the gun and the operator are at the same ground potential.

h. Storing Materials in an Open Yard

Storing materials in an open yard requires attention to combustible material, access, power lines, and fire protection.

- Combustible Materials. Stack combustible materials securely. Stacks or piles must be no more than 16-feet high. Store combustible material at least 10 feet away from a building or structure. Do not store materials where they may block egress or emergency equipment.
- Access. Driveways between and around combustible storage piles must be at least 15 feet wide. Keep them free from accumulations of materials or rubbish. Use a map grid system of 50 by 150 feet when planning driveways in open-yard storage areas for combustible materials.
- Fire Protection. Place portable fire extinguishers rated 2-A:40-B:C at accessible marked locations in the yard so that the nearest extinguisher is no more than 50 feet away from a Class B hazard or 75 feet away from a Class A hazard.

i. Storing Materials Indoors

Storing materials indoors requires attention to access, fire prevention and protection, floor loading, and overhead hazards. Buildings under construction require special precautions.

- Access. Place or store materials so they do not interfere with access ways, doorways, electrical panels, fire extinguishers, or hoist ways. Do not obstruct access ways or exits with accumulations of scrap or materials. Aisles must be wide enough to accommodate forklifts or firefighting equipment.
- Fire Prevention. When storing, handling, and piling materials, consider the materials' fire characteristics. Store noncompatible materials that may create a fire hazard at least 25 feet apart or separate them with a barrier with a fire rating of at least 1hour. Pile material to minimize internal spread of fire and to provide convenient access for firefighting. Emergency fire equipment must be readily accessible and in good working order as referenced in RSHS 1.09, Fire Prevention and Protection.
- Fire Doors. Maintain at least a 24-inch clearance around the travel path of fire doors.
- Sprinklers. Maintain at least an 18-inch clearance between stored materials and sprinkler heads.
- Heating Appliances. Maintain the clearance shown on approved labels or a 3-foot clearance, whichever is larger, between stored materials and unit heaters, radiant space heaters, duct furnaces, and flues.
- Floor Loading. Clearly post load limits in all storage areas. Floors and slabs on grades must never bear a storage load.
- Buildings Under Construction. Materials stored inside buildings under construction must be at least 6 feet away from any hoist way or inside floor openings and at least 10 feet away from any exterior wall that does not extend above the top of the stored material.

j. Stacking Bagged Materials

Stack bagged materials by stepping back the layers and cross keying the bags at least every 10 bags high unless restrained by walls or partitions of adequate strength to prevent tipping of bagged materials.

k. Storing Materials in Bulk

Ensure entry to bulk storage locations, such as silos, hoppers, tanks, or bins (which may be classified as confined spaces), complies with OSHA requirements, RSHS 1.12, Confined Spaces, and local operating procedures.

l. Lumber Storage

Stack lumber on level and solid supported sills so that stacks are stable. Do not pile lumber more than 16 feet high.

m. Bricks and Masonry Blocks

Stack bricks and masonry blocks on level and solid surfaces.

- Bricks. Stack bricks no more than 7 feet high. Offset loose brick stacks at least 2 inches for every foot of height above 4 feet. Stack packaged bricks no more than three units high.
- Masonry Blocks. Offset masonry blocks one-half block per tier above 6 feet.

n. Cement and Lime

Because of fire hazard, unslaked lime shall be stored in a dry area separated from other materials.

o. Handling and Storing Reinforcing, Sheet, and Structural Steel

Stack steel to prevent sliding, rolling, spreading, or falling. Use sleeves when handling steel by a crane or forklift to aid in safe rigging.

p. Handling and Storing Pipe, Conduit, and Cylindrical Materials

- Stacking. Place pipe, conduit bar stock, and other cylindrical materials in racks or stack and block them on a firm, level surface to prevent spreading, rolling, or falling. Use either a pyramidal or battened stack. Offset battened stacks at least one unit per tier and securely wedge them on both sides of the stack.
- Removal. Remove round stock (e.g., wood poles, pipes, and conduit) from a stack by their ends.
- Unloading. Unload carriers in such a way that employees are not exposed to the unsecured load.
- Taglines. Use taglines when working with round stocks.

q. Storing Sand, Gravel, and Crushed Stone

Locate stockpiles in a way that provides safe access for withdrawing material. Material or vertical faces must not overhang. Store materials against walls or partitions only in an amount that will not endanger the stability of the wall or partition.

r. Housekeeping

Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary. Storage of material shall not create a hazard. Bags, containers, bundles, etc., stored in tiers shall be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse in accordance with 29 CFR 1910.176, Materials Handling and Storage.

- Use of Mechanical Equipment. Where mechanical handling equipment is used, enough safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately marked.

- Waste Disposal. Collect, store, and remove hazardous waste and combustible waste products at the end of each workday or work shift. Use noncombustible containers to dispose of waste and rubbish. Equip noncombustible containers with fitted or self-closing covers. Immediately remove and dispose of flammable liquid spills. Place scrap lumber in containers and do not accumulate such lumber in work areas. Remove or bend protruding nails that are not placed directly in containers for removal. Waste may not be buried on site or on federal land.
- Separation of Materials and Waste. Use the SDS to determine appropriate storage and separation of all materials and identify and label material containers. The following materials must be separated:

    - combustible materials such as paper, wood, and natural-fiber fabrics,
    - oily flammable materials, such as saturated or solvent rags,
    - hazardous waste,
    - corrosive and caustic materials, such as batteries,
    - reactive materials that may self-decompose or self-ignite because of heat or a chemical friction reaction,
    - radioactive materials, and
    - toxic materials that may be fatal if inhaled or absorbed through the skin.

- Outdoor Housekeeping. Keep areas adjacent to facilities free from rubbish, waste, and dry, overgrown vegetation. Place combustible waste materials that are stored outdoors while awaiting disposal at least 20 feet away from facilities.
- Storage at Height. Store loose or light materials on roofs or unenclosed heights only if they are safely tied down or secured.
- Sacks and Bags. Remove empty bags that contained cement, lime, or other dust-producing materials from the work area at least daily.
- Excavated Material. When possible, keep roads and walkways clear of excavated materials. When circumstance does not allow this, adequately mark or barricade these areas and provide other access.
- Dropping Material. Do not drop or throw material and debris more than 6 feet. Dropping material more than 6 feet may be allowed with the following specific conditions.

    - Enclosing the Area. The area through which material is dropped must be completely enclosed, with barricades at least 6 feet back from the projected edge of the opening or level above. Signs warning of the hazards must be posted at each level.
    - Chutes. Chutes must be installed to provide protection for persons below. Chutes for debris and scrap must be enclosed for their entire length. Openings for inserting and releasing materials must be equipped with covers and enclosures.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 3.02 Slings, Rigging Hardware, and Wire Rope

1. Scope

This section sets forth equipment requirements for slings, rigging hardware, chains, wire rope and rope end connectors. This section addresses equipment related responsibilities, training, inspection, repair, and removal from service. Please refer to Section 3.03, Permanently Installed Cranes, Appendix 3.03-B, Hoists, for guidance on hoisting and lifting operations, as well as roles and responsibilities involved in hoisting and rigging operations.

2. General Requirements

Safe use of slings is governed by the American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards and the Occupational Safety and Health Administration (OSHA) regulations. It is Reclamation policy to adhere to the contents of the standards listed in Table 3.02-1. Slings and Rigging Standards.

TABLE 3.02-1 Slings and Rigging Standards

Standard Number	Title
ANSI/ASME B30.9	*Slings*
ANSI/ASME B30.10	*Hooks*
ANSI/ASME B30.20	*Below-the-Hook Lifting Devices*
ANSI/ASME B30.26	*Rigging Hardware*
OSHA 23 CFR 1910.179	*Overhead and Gantry Cranes*
OSHA 29 CFR 1910.184	*Slings*
OSHA 29 CFR 1926.251	*Rigging Equipment for Material Handling*
OSHA 29 CFR 1926.753	*Hoisting and Rigging*
OSHA 29 CFR 1926.1412	*Inspection*
OSHA 29 CFR 1926.1413	*Wire Rope—Inspection*
OSHA 29 CFR 1926.1434	*Equipment Modifications*

3. Responsibilities

a. Area Office Safety Professional

- Shall verify annually inspection documentation is complete, clear, and in conformance with this section, FIST 4-1A, and manufacturer's procedures.
- Shall verify annually that equipment is inspected, tested, and documented as required by this section.
- Shall ensure equipment is consistently documented or marked.

b. Facility Manager

- Shall designated and coordinate/provide training for designated person(s) to complete daily/shift equipment inspections.
- Shall ensure the designated person doing daily/shift inspections understands the hazards, equipment use, testing, documentation and wear and tear.
- Shall ensure employees using slings, wire rope, and rigging hardware have the necessary personal protective equipment.
- Shall ensure equipment inspection documentation is available and includes date, signature of who performed the inspection and identity of equipment inspected.
- Shall ensure equipment is consistently and clearly labeled or marked.

4. Training Requirements

a. Initial

Inspection of equipment shall be completed by a designated person who has been trained in equipment selection, inspection, potential hazards and cautions to personnel, effects of environment, and rigging practices of the specific components/equipment in use. The designated person shall be trained to meet ASME B30 requirements for rigging inspection and removal from service.

b. Recordkeeping

All Reclamation training records shall be kept in the Department of the Interior (DOI) official repository.

c. Hazard Identification, Assessment, and Safety Measures

- Equipment Hazard Identification. Slings, rigging hardware, and related equipment shall be visually inspected before each use. Remove items from service if found to be deformed, damaged or otherwise do not meet inspection criteria and are not safe for use. Manufacturer's instructions shall be referred to for equipment specific signs of damage or excessive wear and tear.

    - Slings. Slings (any material or shape) shall be removed from service if showing any visible damage or defects, such as snags, punctures, tears, cuts, work stitches or core yarn, elongation, knots, broken/worn fittings, or inability to function as designed. Cut up and discard slings removed from service due to defects or plainly mark them as being unfit for load-bearing service.
    - Hardware. Hardware shall be removed from service if showing visible signs of acid or caustic burns, melting or charring, heat damage from welding and arc strikes, pitting or corrosion, 10% reduction of the original dimension at any point, distortion or inability to function as designed.
    - Temperature and Chemical Limitations. Extreme temperatures and chemically active environments may reduce the performance or degrade the strength and integrity of

components. Manufacturer instructions and information must be consulted for temperature limits and use in chemically active environments. If identification is missing or illegible, equipment shall be removed from use until approved by a qualified inspector.

- Unauthorized Alterations. Unauthorized alterations to equipment shall be cause for removal from service. A qualified registered PE must approve any special equipment used to complete a lift. Modifications or additions which affect the capacity or safe operation of the equipment are unauthorized and prohibited until the requirements of 29 CFR 1926.1434 are met.

5. Safe Practices

a. Safe Use

Use of equipment by a designated qualified person for rigging operations shall comply with equipment manufacturers' instructions/recommendations.

b. Protection and Storage

Protect slings with a material of enough strength, thickness, and construction to prevent damage to strands, fibers, wires, or links from sharp, rough, or square corners. Properly store slings when they are not in use to protect them from mechanical damage, corrosive action, moisture, temperature extremes, ultraviolet light, ozone, or other factors as appropriate. Hardware shall be stored away from extreme heat and chemicals, or other potentially damaging conditions.

c. General Safe Practices

Whenever any sling is used, observe the following practices:

- identify each sling with a tag or band for use and inspection purposes;
- do not use damaged or defective slings;
- do not shorten slings with knots, bolts, or other makeshift devices, or kink sling legs;
- do not load slings in excess of their rated capacities;
- balance the loads of slings used in a basket hitch to prevent slippage;
- do not rig slings or legs less than 30 degrees;
- securely attach slings to their loads;
- pad or protect slings from the sharp edges of their loads;
- keep suspended loads clear of all obstructions;
- keep all employees clear of loads about to be lifted and of suspended loads;
- do not place hands or fingers between the sling and its load while the sling is being tightened around the load;
- prohibit shock loading; and
- do not drag slings on the floor or over an abrasive surface.

d. Inspections

Conduct thorough visual inspections of equipment, observing for apparent deficiencies, proper labeling of equipment, and adherence to manufacturers' recommended use. Inspections shall be performed in accordance with Reclamation FIST 4-1A, Chapter 6, Cranes, Hoists, Rigging Equipment, and Elevators, 29 CFR 1926.1412, Inspections, and 29 CFR 1926.1413, Wire rope—inspections.

- Initial. An inspection shall be conducted before initial use and after any approved alterations are made. This is performed by the manufacturer or a qualified professional engineer (PE) for any altered/modified equipment.
- Daily/Shift. Prior to using specific equipment, daily or shift inspections shall be conducted by the operator and qualified rigger.
- Frequent. Frequent inspections by a qualified rigger shall be performed monthly or more frequently as needed, per FIST 4-1A, chapter 6. Considerations of frequency shall include the use, severity of service conditions, nature of lifts, and experience with equipment in similar circumstances.
- Periodic. Periodic inspections shall be performed annually or more frequently as needed, by the area office safety professional and a qualified rigger designated by the facility manager.
- Documentation. Inspection records shall be retained until the next periodic inspection and available for operating personnel and upon request for employees and compliance officials.

e. Job-Fabricated/Purpose-Built Rigging Hardware

A qualified PE must design and certify the use of any job-fabricated/purpose-built rigging hardware to be built to a safety factor of 5. Proof test any special custom job-fabricated/purpose-built hardware to 125% of rated load. Inspection criteria for job-fabricated and purpose-built below-the-hook lifting devices, other than slings, shall follow ANSI/ASME B.30.20, specifically sections 20.1.3.1 through 20.1.3.7 and 20.1.3.9.

f. Use, Repair, and Maintenance

The use, repair, and maintenance of ropes, chains, slings, and rigging accessories must conform to the manufacturer's written instruction, applicable standards listed in Table 3.02-1, and Reclamation FIST 4-1A, Chapter 6, Cranes, Hoists, Rigging Equipment, and Elevators.

g. Alloy Steel Chain Slings

For additional information, refer to Reclamation FIST 4-1A, 6.11.4, Alloy Steel Chain Slings, 29 CFR 1910.184(e), 29 CFR 1926.251(b), and ANSI/ASME B30.9, Chapter 9-1 Alloy Steel Chain Slings: Selection, Use, and Maintenance.

- Identification. Alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and reach. Only rigging identified chain shall be used for rigging operations.
- Working Load Limit. Chains shall have a minimum design factor of 5 of the anticipated rated load. Do not exceed the manufacturer's working load limit for any configuration.
- Proof Testing. Proof test load requirements are listed in ANSI/ASME B30.9. When repaired, a chain sling must be permanently marked to identify the repairing agency. Prior to use, each new, repaired, or reconditioned alloy steel chain sling and all welded parts in the sling assembly shall be proof tested by the manufacturer or a qualified person. Make a copy of the proof test certificate, including the date and weight, and make the records available for examination.
- Grade. In hoisting operations, use only heat-treated alloy steel chains that meet at least Grade 80. Alloy steel chains shall have permanently affixed identification stating size, grade, rated capacity, and reach.
- Attachments. The rated capacity of hooks, rings, links, or other attachments used with alloy steel chains must at least equal that of the chains. Do not use job-made hooks, links, or makeshift fasteners made from bolts or rods.
- Shock Loading. Do not subject chains to shock loading.
- Excessive Wear. Whenever the wear at any point in any chain link, or the depth of gouge or rounded out portion, exceeds the measurements in Table 3.02-2, remove it from service. Use a device capable of measuring to one-thousandth of an inch to measure chain wear. Remove any sharp nicks by hand filing.

TABLE 3.02-2 Minimum Allowable Thickness on a Link

Original nominal chain stock diameter (inches)	Minimum allowable thickness at any point on a link (inches)
7/32=0.219	0.189
9/32=0.281	0.239
5/16=0.313	0.273
3/8=0.375	0.342
1/2=0.500	0.443
5/8=0.625	0.546
3/4=0.750	0.687
7/8=0.875	0.750
1=1.000	0.887
1-1/4=1.250	1.091

h. Wire Rope Slings

For additional information, refer to FIST 4-1A, 6.11.5, Wire Rope Slings, 29 CFR 1910.184(f), 29 CFR 1926.251(c), and ANSI/ASME B30.9, Chapter 9-2 Wire Rope Slings: Selection, Use, and Maintenance.

- Working Load Limit. Do not exceed the manufacturer's working load limit for any configuration. For angles other than those shown on the manufacturer's tag, use the rated load for the next lower angle, or a qualified person shall calculate the load.
- Identification. If the wire rope sling identification tag is missing or illegible, remove from service and replace or send it back to the manufacturer for recertification and identification.
- Proof Test. Proof test load requirements are listed in ANSI/ASME B30.9. Job- made or repaired slings shall be proof tested by the sling manufacturer or a qualified person prior to use. Make a copy of the proof test certificate, including the date and weight, and make the records available for examination.
- Protruding Ends. Cover or blunt protruding ends of strands in splices on slings and bridles.

i. Synthetic Web Slings

For additional information, refer to FIST 4-1A, 6.11.8, Synthetic Webbing Slings 29 CFR 1910.184(i), 29 CFR 1926.251(e), and ANSI/ASME B30.9, Chapter 9-5 Synthetic Webbing Slings: Selection, Use, and Maintenance.

- Working Load Limit. Do not use a webbing sling at a load greater than the manufacturer's established working load limit. Follow the manufacturer's recommended working load limit for the specific angle of loading.

j. Metal Mesh Slings and Synthetic Rope Slings

For additional information, refer to FIST 4-1A, 6.11.6, Metal Mesh Slings & 6.11.7, Natural and Synthetic Fiber Rope Slings. If either metal mesh slings or synthetic rope slings are selected for special use, consult with the appropriate section of 29 CFR 1910.184(g) & (h), 1926.251(d), and ANSI B30.9.

k. Rigging Hardware

For additional information, refer to FIST 4-1A, 6.11.9, Rigging Hardware, and 29 CFR 1926.251(f).

- Shackles. Each new shackle body and pin shall have forged, cast, or die stamped markings by the manufacturer to show the name or trademark of the manufacturer, working load limit (WLL), size shackle pin and identification/markings.
- Adjustable Hardware. This hardware used for hoisting must be designed with a minimum safety factor of 5. Load rating will be in accordance with the hardware manufacturer's

specifications. If found defective, the rigging hardware will not be repaired; it will be removed from service. All eyebolts shall be forged alloy steel and equipped with shoulders or collars.

- Hooks. Hooks shall meet or exceed the requirements of ANSI/ASME B30.10 Hooks. Hook latches (keepers) are required on lifting hooks. Latch equipped hooks will be used for all hoisting and rigging operations unless the application makes the use of the latch impractical or unsafe. Hooks without latches, or with latches that are removed or disabled, must not be used unless a qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied back). Alterations and repair of hooks or latches by welding or reshaping are not permitted.

l. Below-the-Hook Lifting Devices

For additional information, refer to FIST 4-1A, 6.11.13, Below-the-Hook Lifting Devices and ASME B30.20, Below-the-Hook Lifting Devices. A qualified PE must verify any existing and new job-fabricated/purpose-built below-the-hook lifting devices meet the required design factor.

m. Wire Rope

Refer to 29 CFR 1926.251(c), ASME B30.2-2.2, Rope Inspection, and ASME B30.2-4.3, Rope Replacement and Maintenance for additional guidance.

- Working Load Limit. Manufacturer's specification data shall be used in determining working load limit and proper application. Wire rope used for hoisting shall be designed with a minimum safety factor of 5. Calculate the maximum working load limit of wire rope, dividing the manufacturers' supplied breaking strength by the safety factor.
- Inspection and Retirement. Trained personnel shall inspect wire rope on hoists on a regular basis in accordance with the manufacturer's recommendation. 29 CFR 1926.1413, Wire rope inspection, includes specific deficiencies, critical review items, and inspection frequency. Refer to FIST 4-1A, 6.5 Inspections, for guidance regarding wire rope inspection as a part of crane inspection.
- Wire Rope Clip Connectors. Wire rope clip connectors may use the U-bolt type or the twin base clip ("First" grip, double saddle) type. Use only new clips in making wire rope clip connectors.
- U-bolt Type Clip. U-Bolt clip saddle will be placed on the live end and shall be constructed from stainless steel or drop forged steel protected by an application of galvanized zinc coating. Consult the manufacturer for correct torque values, exact number of required clips, and spacing dimensions.
- Twin Base Clips. Twin base clips shall be placed on the live end and must be constructed from stainless steel or drop forged steel protected by an application of galvanized zinc coating. Consult the manufacturer for correct torque values, exact number of required clips, and spacing dimensions.

- Wedge Socket. Regularly inspect the integrity of the wire rope at the point of exit of the dead-end side. When the wire rope has met one-fifth of service life, remove the portion through the wedge and move the wedge up the rope to a new location.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 3.03 Permanently Installed (Fixed) Cranes

1. Scope

This section sets forth safety requirements for permanently installed cranes, also known as fixed cranes, and the safety roles and responsibilities for Bureau of Reclamation (Reclamation) personnel and other government employees or contractors using Reclamation equipment. Reclamation Safety and Health Standard (RSHS) Section 3.04, Mobile Cranes, covers mobile crane safety. Appendix 3.03-A, Riggers and Signalpersons, of this RSHS section, covers signalpersons and rigger training, which apply to both permanently installed and mobile cranes. Appendix 3.03-B, Hoists, of this RSHS section, covers hoists and safe hoisting practices.

2. General Requirements

The American Society of Mechanical Engineers (ASME) B30 standards and the Occupational Safety and Health Administration (OSHA) regulations, 1910 Subpart N for general industry use and 1926 Subpart CC for construction use govern crane safety. Within Reclamation, safety standards commonly limit permanently installed cranes to general industry use. Reclamation Facilities Instructions, Standards, and Techniques (FIST) 4-1A, Maintenance Scheduling for Mechanical Equipment, covers the maintenance, operation, inspection content and requirements, removal from service, record keeping for inspection and testing, load testing, equipment design, performance, and modification of permanently installed cranes.

3. Responsibilities

a. Regional Safety Managers

- Shall conduct periodic reviews of local crane safety programs as part of their normally scheduled safety and occupational health program evaluations.

b. Area Office Managers

- Shall designate a Reclamation employee, or third-party evaluator, to assess operators, signalpersons, and riggers.

c. Area Office Safety Professionals

- Shall review critical lift plans.

d. Facility Managers

- Shall select qualified personnel to maintain and repair permanently installed crane equipment and components.
- Shall ensure proper maintenance, testing, and repair/replacement of equipment by qualified personnel and will make the respective documentation available for review.

- Shall ensure permanently installed crane equipment have preventive maintenance schedules established, as well as detailed and accurate maintenance job plans, prepared in accordance with FIST 4-1A, Maintenance Scheduling for Mechanical Equipment.
- Shall ensure maintenance and repair personnel follow applicable safety procedures and have the tools and documentation, including equipment manuals, necessary to accomplish their work.
- Shall verify that a third-party evaluator or qualified person evaluates equipment operators, signalpersons, and riggers.
- Shall verify that a qualified inspector or third-party evaluator completes crane inspections, per 3.01.7.2, Crane Inspections, of this section.

e. First-Line Supervisors

- Shall provide or coordinate training to ensure that crane operators under their supervision meet the requirements set in 3.03.4, Training Requirements, of this section.
- Shall document the operator evaluation to include the name of the certifying organization; operator's name; evaluator's name and signature; date of the evaluation; and the make, model, and configuration of the crane used for the evaluation.
- Shall make the operator evaluation documentation available digitally or on the worksite for as long as the operator is employed.
- Shall provide or coordinate retraining and re-evaluation if an operator is not competent in a necessary aspect of safe crane operation.
- Shall determine if a load is a critical lift and designate someone other than the crane operator to supervise the planning and execution of the critical lift (see 19A.7.6) per FIST 4-1A, 6.9.3, Designated Person.
- Shall designate qualified person to develop a job hazard analysis (JHA) and ensure that all staff follow the JHA for all crane assembly/disassembly, inspection, maintenance, hoisting, and rigging operations.
- Shall ensure all staff operate equipment safely.
- Shall ensure all staff use preplanned and approved hoisting and rigging instructions when necessary, and always for critical and engineered lifts.
- Shall ensure operators resolve or properly tag all equipment problems if found to be unsafe or requiring restrictive use.
- Shall assign a qualified lift supervisor to critical lift operations.
- Shall ensure any signalpersons are qualified and trained for the task assigned prior to giving any signals.
- Shall provide crane operators the time and resources necessary to receive required medical surveillance examinations.
- Shall maintain an inventory of their employees who are qualified crane operators, signalpersons, and riggers. Inventory shall include dates of training and/or certification, retraining where required, and dates of medical clearance.

f. Lift Supervisors for Critical Lifts

- Shall be designated by the first-line supervisor as the person to supervise the planning and execution of the critical lift.
- Shall ensure that all members participating in the critical lift completely understand the work instruction and any revisions to those instructions for the critical lift.
- Shall ensure all operators and staff perform the activities listed in FIST 4-1A, 6.9, Critical Lifts.

g. Crane Operators

- Shall complete all required training, designations, and evaluations for the skills, knowledge, and ability to recognize and avert risk for operating the specific type of crane or device they will be operating.
- Shall ensure that equipment is current on all inspections prior to lifting and that all members participating in a lift completely understand the work instruction for the lift.
- (3) Shall not assume the role of a qualified rigger, as a qualified operator does not necessarily meet the requirements of a qualified rigger.
- Shall visually inspect equipment prior to or during each shift when the equipment is in use, per 3.03.7.f of this section.

h. Signalpersons

- Shall be trained and qualified prior to giving any signals.
- Shall agree upon and understand communication signals and radio standards with crane operator and other personnel involved.

i. Riggers

- Shall be trained and qualified prior to performing rigging operations or shall be a rigger in training under the direction of a qualified rigger.
- Shall participate in assembly/disassembly activities, additionally whenever workers are within a fall zone hooking/unhooking/guiding a load or initially connecting a load to a component or structure.
- Shall perform the duties commensurate with their level of certification or qualification, including assembly/disassembly of rigging, inspection of rigging prior to lift, hooking/unhooking, and guiding a load.
- Shall understand and familiarize themselves with RSHS Section 3.02, Slings, Rigging Hardware, and Wire Rope.

j. Crane Inspectors

- Shall inspect cranes prior to initial use and any equipment that have had professional engineer approved modifications or additions which affect the safe operation of the equipment or capacity, per 3.03.7.b of this section.
- Shall inspect equipment on an annual basis per 29 CFR 1910.179(j).

k. Crane Maintenance and Repair Persons (Reclamation Employee)

Shall only operate equipment to the extent necessary to perform maintenance, inspect equipment, or verify performance.

l. Designated Evaluators (Reclamation Employee)

- The area office manager shall designate evaluators based on qualifications of knowledge, training, and verifiable experience.
- Shall evaluate the skills, knowledge, experience, and ability of crane operators, signalpersons, and riggers to recognize and avert risk when performing their respective duties.

4. Training Requirements

a. Initial

- Crane Operators. First-line supervisors shall provide crane operator training to promote proficient performance of a crane operator. Training shall include:

    - physical characteristics of the workplace,
    - performance characteristics and complexity of the crane,
    - type of load (multiple piece loads, raw materials, bulk materials, machine assemblies, fragile and durable materials, etc.),
    - responsibilities of the crane operator and other persons involved in the movement of the load(s),
    - safe operation of specific type(s) of equipment they will be operating (controls and operation, use and calculation of load/capacity information for various configurations of the equipment),
    - equipment manuals,
    - inspections,
    - operational and maneuvering skills,
    - safe shut-down procedures, and
    - electrical safety.

- Crane Inspectors. An accredited organization or qualified in-house resource shall provide training and shall include information specific to the type of permanently installed/fixed crane(s) to be inspected.
- Riggers and Signalpersons. Refer to Appendix 3.03-A, Riggers and Signalpersons, for requirements.

b. Proficiency Qualification for Permanently Installed Crane Operators

When operating permanently installed cranes for maintenance work, crane operators shall meet the following requirements:

- trained for the specific type of crane they will be operating,
- completed formal training and testing, and
- medically cleared.

c. Refresher Training

First-line supervisors shall provide or coordinate retraining for staff based on their performance and/or if there is any indication that retraining is necessary.

d. Recordkeeping

The first-line supervisor shall keep a list of operators, riggers, and signalpersons up to date. All Reclamation training records shall be kept in the Department of the Interior official repository.

5. Hazardous Environmental Conditions

a. Wind

Outdoor crane activities shall have means for monitoring local weather conditions, including a wind speed device located where it can measure maximum wind speed for the area. The crane operator, supervisor, or qualified person all have the authority to cease operations when monitoring has identified hazardous conditions.

- Prior To Operation. Prior to setting up a lift, a reliable weather source must confirm wind conditions. There shall be no immediate threat of wind speeds reaching 20 miles per hour (mph) or greater. Operators shall record these wind speeds at 30 feet above open ground. Cranes subjected to high winds shall have travel restraints when not in use.
- During Operations. Operators will not conduct lifting operations when wind speeds, including gusts, at the site, reach 25 mph. At 20 mph or more, operators must evaluate wind loading on the crane for safety. This determination will be based on wind calculations per manufacturer's recommendations.
- Postponing Operation. First-line supervisors must consult manufacturer recommendations for storing the crane during high-wind events. When high wind/gust conditions postpone crane operations, loads must be landed and secured. Operators shall secure all outdoor cranes capable of traveling upon rail by means of travel restraints, storm brakes, thruster wheel chocks, or similar devices when not in use.

b. Lightning

First-line supervisors must shut down crane and hoisting operations when lightning occurs or is forecasted within 5 nautical miles. Employees in affected locations shall cease all outside activities and seek shelter.

6. Safety Equipment

a. Fire Extinguishers and Maintenance

Facilities shall provide fire extinguishers and provide training specific to the type of fire extinguisher provided. Facilities and operators shall not use carbon tetrachloride extinguishers. Facilities shall install a portable fire extinguisher, with a basic minimum extinguisher rating of 10 BC, in the crane cab/operator station. Facilities shall maintain and inspect portable fire extinguishers monthly per RSHS Section 1.09, Fire Prevention and Protection.

b. Lightning

Cab lighting, either natural or artificial, shall provide a level of illumination that enables the operator to observe the operating controls as well as the load and rigging when they are in the operator's line of sight.

c. Self-Rescue Devices for Cab Operated Cranes

Crane operators working in a cab-operated crane shall have means for self-rescue in place. There shall be a means of egress from cab-operated cranes to permit departure under emergency conditions.

7. Safe Practices

a. Authority to Stope Operation

Whenever there is a concern as to safety, employees must have the authority to stop work until a qualified person assures safety. Other onsite personnel will alert the operator if they believe unsafe operating conditions exist. Reclamation Manual Policy, Safety and Occupational Health Program (SAF P01), Appendix A, Stop Work Procedures, and Appendix B, Stop Work Action Procedural Checklist, describe Reclamation stop work procedures. If the crane operator observes an adverse operating condition, the operator has the authority to suspend operations and notify the supervisor for resolution.

b. Crane Inspections

Refer to 29 CFR 1910.179(j) and FIST 4-1A, 6.5, Inspections. Facilities and crane operators shall follow any part of a manufacturer's procedures regarding inspections that relates to safe operation that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section. Previous inspection documents must be made available to crane inspectors.

- Initial/Startup. Operators shall perform initial/startup before initial use and when cranes have been altered in a manner that affects safe operation or load handling equipment components.
- Frequent. The operator or other qualified personnel shall inspect crane equipment, prior to each use on each shift. The inspection shall include:

  - all functional operating mechanisms for maladjustment interfering with proper operation,
  - deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems,
  - hooks with deformation or cracks,
  - hoist chains, including end connections, for excessive wear, twist, distorted, or stretched links,
  - all functional operating mechanisms for excessive wear of components, and
  - rope reeving.

- Periodic. The operator or other qualified personnel shall inspect all permanently installed cranes in regular use monthly, or more frequently as conditions require. Inspection shall include:

  - deformed, cracked, or corroded members,
  - loose bolts or rivets,
  - cracked or work sheaves and drums,
  - worn, cracked, or distorted parts,
  - excessive wear on brake system parts,
  - load, wind, and other indicators over their full range for any inaccuracies,
  - gasoline, diesel, electric, or other powerplants for improper performance or noncompliance with safety requirements,
  - excessive wear of chain drive sprockets and chain stretch, and
  - electrical apparatus for signs of pitting or deterioration.

- Periodic/Annual. Operators shall perform inspections annually or more frequently as conditions require by a qualified person or third-party evaluator.
- Standby Cranes. Qualified personnel shall inspect standby cranes at least semi-annually in accordance with periodic inspection requirements. When an inspector returns standby cranes to service which have not been in use for more than 1 month, but less than 6 months, the crane shall be inspected per the frequent inspection requirements as well as a thorough rope inspection. When an inspector returns equipment to use after an idle period of 6 or more months, it shall be inspected per the frequent and periodic inspection requirements as well as a thorough rope inspection. A thorough rope inspection shall include any type of deterioration and a certification for continued use (including date, signature of inspector, and identifier of the specific rope).
- Third-party Inspection. A third-party qualified inspector may be a Reclamation employee outside the chain of command of the crane's facility or maintenance manager. A third-party may also be a contracted person/entity that specializes in the inspection of cranes and holds the required certifications specific to the inspected type of the crane.
- Load Testing. Refer to FIST 4-1A, 6.7.2, Periodic Load Tests, and FIST 6.13.7, Testing, for additional guidance. Facilities shall conduct load tests in accordance with applicable

ASME standards and manufacturer's recommendations. The load test shall be conducted prior to use when any load bearing or load-controlling component has been altered, replaced, or repaired. In accordance with RSHS Section 1.11, Walking and Working Surfaces, paragraph 1.11.9.t.(3), Additional Inspections and Tests, facilities shall also perform load tests prior to lifting personnel in an approved Personnel Lifting Platform at 150 percent of the intended load of the personnel platform.

c. Medical Surveillance

Qualified medical personnel shall conduct medical surveillance of crane operators per the Interior Office of Occupational Safety and Health, Medical Program Handbook, Crane Operators (page 215-224). Medical personnel shall conduct medical evaluations both as pre-placement for crane operators as well as every 3 years thereafter, or more frequently, as required. The employee's local HR office manages all medical clearances.

d. Electrical Safety

For Reclamation's electrical safety standards refer to RSHS Section 1.10, Electrical Safety Requirements. Crane wiring and equipment shall comply with 29 CFR 1910, Subpart S, Electrical. The control circuit voltage shall not exceed 600 volts for AC or DC current. The voltage at pendant pushbuttons shall not exceed 150 volts for AC and 300 volts for DC. Where a crane uses multiple conductor cable with a suspended pushbutton station, the station must be supported in a satisfactory manner that will protect the electrical conductors against strain. Operators shall only use pendant control boxes that prevent electrical shock and are clearly marked for identification of functions.

e. Duty Periods

Operators will not work, or be at the jobsite, more than 12 hours in any 24-hour period. The operator will not engage in any activity that will divert their attention while operating the equipment, nor will the operator leave their position while a load is suspended.

f. Critical Lifts

A critical lift is a nonroutine lift requiring detailed planning and additional or unusual safety precautions. Refer to FIST 4-1A, 6.9, Critical Lifts, for critical lift plan content, approval, pre- lift meeting, and documentation. Dependent upon the situation, the facility manager, a qualified engineer, and the area office safety manager should review critical lift plans. The first-line supervisor to supervise the planning and execution of the critical lift shall designate the critical lift supervisor. The designated person shall have an understanding and familiarity with the equipment, inspections, load tests (if required), and the work instruction so that they can clearly communicate and coordinate during the execution of the critical lift.

g. Engineered Lifts

Operators shall plan engineered lifts that exceed the crane's rated capacity in accordance with ASME B30.2-3.4, ASME B30.16-3.5, and ASME B30.17-3.4. Engineered lifts shall not exceed 110 percent of the rated capacity.

h. Powerline Safety

Prior to operating permanently installed/fixed cranes, first-line supervisors shall assess the area for any potential powerline hazards and document the assessment in the JHA.

i. Restriction of Lifting Personnel

Unless there is a specific variance issued in accordance with the RSHS and meeting the intent of an OSHA standard, no person may ride loads, blocks, buckets, hooks, scaffolding, boatswain's chairs, cages, or other devices attached to hoist lines, booms, or attachments of any crane, derrick, or materials hoist. Designated maintenance personnel may ride the carriage service platform of a cableway to perform inspection testing or maintenance. Operations using crane-supported personnel platforms are considered critical lifts. Employees may only ride in/on a personnel platform specifically manufactured for lifting personnel. Refer to RSHS Section 1.11, Walking and Working Surfaces, paragraph 1.11.9.q, Crane-Supported Personnel Platforms, for crane-supported personnel platform guidance.

j. Modifications

Any modification or repair to a permanently installed/fixed crane shall have a qualified engineer to oversee, inspect, and approve all changes per 29 CFR 1910.179(b)(3), prior to initial use.

8. Cableways

In addition to the requirements previously listed, cableways shall comply with the installation, testing, operation, and maintenance requirements in the current edition of ASME B30.19, Cableways.

a. Design and Installation

A qualified engineer will design cableways. Qualified personnel shall install and operate cableways according to the engineer's design drawings, specifications, and operating, maintenance, and inspection instructions.

b. Cableway Log

First-line supervisors shall maintain a log for each cableway to record inspections, lubrication, maintenance, and repair activities. The log must include operating time and downtime, and the employee responsible for performing the maintenance or repair work must sign it. The log must be made available for review.

c. Signal System

The operator and the signalperson must continuously maintain at least two systems of communication between them. At least one of the systems shall provide voice communication by telephone or radio. The second system shall use lights or bells as the signaling means. When the dual system is not functioning properly, the operator may deliver the load suspended from the cableway, but the operator will rig no further load until both communication systems are functioning.

d. Control Consoles

During operation of the cableway, only the operator(s) are permitted in the control console room. The console room windows shall be safety glass that introduces no distortion that would interfere with the safe operation of the cableway.

e. Operating Controls

All controls shall automatically return to neutral and set the brakes when released. The manufacturer must plainly mark each control to indicate its function and ensure that it is within easy reach of the operator.

f. Cableway Platforms and Carriages

Facilities shall provide cableway inspection platforms, moving and stationary, with standard guardrails and toeboards. Facilities shall enclose open areas on carriages and moving platforms with wire mesh to reduce the hazard from falling objects.

g. Concrete Buckets

Manufacturers shall design concrete buckets with a safety device to prevent accidental opening of the bucket while in transit to the discharge site. These buckets must be constructed to prevent aggregate from lodging in any part of the bucket. Refer to RSHS Section 4.04, Concrete, Masonry, Construction, and Formwork.

h. Riding Cableways

First-line supervisors shall prohibit riding the cableway, except for designated maintenance personnel who may ride the carriage service platform of a cableway to perform inspections or maintenance. First-line supervisors shall then prepare and review a JHA before performing inspections or maintenance.

i. Track-Mounted Towers

Facilities shall equip track-mounted cableway towers or structures with both limit switches and rail stops, or with buffers at each end of the tracks. The facility shall also equip the wheel with track or rail sweeps that extend below the top of the rail and are effective in all directions of travel. When two or more towers operate on the same track, the facility shall install an automatic control system to prevent the towers from colliding.

9. Communication Requirements

A signalperson shall be present when the point of operation is not in full view of the operator, when the view in the direction of travel is obstructed, or the operator feels a signalperson is necessary.

a. Hand Signal Standards

The signalperson shall use Standard Method hand signals, per 29 CFR 1926 Subpart CC App A, Standard Hand Signals, unless it is infeasible, or an operation is not covered by the standard method. The signalperson, operator, and lift supervisor shall review and agree upon any non-standard hand signals.

b. Radio Signal Standards

Operators shall test radio devices used to transmit signals to ensure transmission is reliable, clear, and effective. All staff shall use a dedicated radio channel shall unless the coordination or conditions of the work prohibit such use.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Appendix 3.03-A: Riggers and Signalpersons Requirements

1. Scope

Riggers and signalpersons that participate in any lifts or hoisting activities shall only perform duties commensurate with their level of certification or qualification. The requirements applicable to performing these roles are addressed in 29 CFR 1926 Subpart CC, Cranes and Derricks in Construction:

- 29 CFR 1926.1428, Signal person qualifications
- 29 CFR 1926.1431, Hoisting personnel

2. Training Requirements

a. Initial

- Signalpersons. Signalpersons shall be trained and qualified prior to giving any signals. Training shall meet the requirements of 29 CFR 1926.1428, to know and understand:
    - types of signals used,
    - application of signals used,
    - basic equipment operation and limitations including crane dynamics when hoisting loads,
    - general signal requirements,
    - standard voice and hand signals, and
    - radio, telephone, and other electronic signals.

- Riggers. Persons performing rigging work shall be trained and qualified prior to performing any rigging duties. Training shall meet the proficiency requirements in A.2.2.2 and include:
    - hoisting and rigging hazards,
    - factors that reduce capacity,
    - calculating load weights, load angle factors, and center of gravity,
    - lift point identification,
    - 29 CFR 1910.184, Slings,
    - 29 CFR 1926.251 Rigging equipment for material handling,
    - ASME B30 as it pertains to lifting and material handling related to lifting equipment,
    - sling use and inspection,
    - basic hitch connections, their advantages, and disadvantages,
    - calculating sling loading based on rigging configuration,
    - basics of crane operation and what to be aware of during a lift,
    - signal operations, and

- rigging hardware use and inspection criteria.

b. Proficiency Qualification

- Signalpersons. The signalperson is considered qualified if they:
  - meet the requirements of a qualified person, and
  - know and understand the type of signals used at the worksite, and
  - are competent in using signals.

- Riggers. At a minimum, a qualified rigger:
  - possesses a recognized degree, certificate, or professional standing, or
  - has extensive knowledge, training, and experience, and
  - can successfully demonstrate the ability to solve problems related to rigging loads.

Appendix 3.03-B: Hoists

1. Scope

This Appendix is dedicated specifically to addressing hoists.

2. Safe Practices

a. Inspections

Hoisting devices rated below 5 tons (non-construction and other hoists) will be inspected by a qualified Reclamation employee or by a qualified third party.

b. Hoist Equipment for Spillway Gates

Refer to Reclamation Operation & Maintenance guidance and training resources Review of Operation and Maintenance Program Field Examination Guidelines and Guidelines for The Process of Evaluating the Reliability of Mechanical Equipment During Dam Safety Comprehensive Facility Review Examinations for inspection guidance for spillway gates hoist equipment.

3. Hoists

Base-mounted drum hoists will conform to the requirements of ASME B30.7 Winches. Air-powered hoists must conform to the requirements of ASME HST-6M Performance Standard for Air Wire Rope Hoists, or more stringent requirements of this section. Hoisting machines used in personnel related systems must also meet the requirements in the following paragraph, B.4 Overhead Hoists. The hoist manufacturer or a qualified engineer must design base mounted hoisting systems.

4. Overhead Hoists

Install, operate, and maintain overhead hoists in compliance with the more stringent provision of this subsection and ASME B30.16 Overhead Underhung and Stationary Hoists.

a. Design

The manufacturer or a qualified engineer must design hoists and hoist suspensions and anchorages.

b. Restrictions

Base-mounted drum hoist systems involving personnel use or exposure (e.g., movable work platforms, raising or lowering drilling machines, and personnel hoists) must conform to the provisions of this subsection.

c. Working Load Limit

Indicate the working load limit, as determined by the manufacturer, on the hoist. Do not exceed the working load limit.

d. Support

Design the supporting structure to withstand the loads and forces imposed by the weight of the hoist and its rated load. The support will provide unobstructed movement of the hoist and load. It will also permit the operator to stand clear of the load in all hoisting positions.

e. Anti-Two Blocking Device

Equip power-operated overhead hoists with a limit switch to prevent the load hook from exceeding the upper travel limit.

f. Hoist Controls

Controls on powered hoists will return to a neutral position when released, and load hook movement will stop.

g. Brakes

Except for hand-powered hoists, all overhead hoists will have brakes that apply automatically when the controls are in neutral.

h. Air-Operated Hoists

Connect air hoists to an air supply of sufficient capacity and working pressure to safely operate the hoist with maximum load.

i. Hand-Powered Hoists

Hand-powered hoists will be worm-gear driven or equipped with a pawl or ratchet system that provides continuous effective control and braking reliability.

5. Material Hoists

In addition to the safe practices previously listed, material hoists shall conform to the manufacturer's instructions, 29 CFR 1926.552 Material hoists, personnel hoists, and elevators, and the current edition of ASSP A10.5 Safety Requirements for Material Hoists.

a. Assembly

The manufacturer or a qualified engineer shall supervise assembly and disassembly of hoist towers and material hoists.

b. Car-Arresting Devices

Test car-arresting devices before initial use and every 4 months thereafter. Conduct tests in accordance with ASSP A10.5.

c. Posting

Post operating rules, including signals, line speeds, and loading, at the operator's station and on the cage frame or crosshead. A copy of the hoist operating manual shall always be available during operation.

d. Riding

Do not permit anyone to ride a material hoist, except for inspection and maintenance. Conspicuously post with "NO RIDERS ALLOWED."

e. Hoistway Entrances

Protect entrances to the Hoistway in accordance with 29 CFR 1926.552(b)(2), using substantial gates or bars that are installed the full width of the landing entrance and equip with a latching device. Paint entrance bars and gates with diagonal contrasting colors, such as black and yellow stripes.

f. Overhead Protection

Protect the top of the cage or platform with 2-inch planking, 3/4-inch plywood, or material of equivalent strength.

g. Tower Enclosures

The following requirements will apply:

- Enclosed. An enclosed hoistway or tower will be enclosed on all sides for its entire height, with half-inch wire mesh screen, No. 18 U.S. gauge wire or equivalent, except at access points.
- Open Sides. For an unenclosed hoist tower, totally enclose the hoist cage or platform on all sides between the floor and the protective top with half-inch wire mesh screen, No. 14 U.S. gauge wire or equivalent. The hoist cage or platform enclosure will include the required gates for loading and unloading. Install an enclosure at least 6 feet high on the unused sides of the hoist tower at ground level.

h. Operator's Station

Protect the operator's station with overhead planking not less than 2 inches thick or with material of equivalent strength.

i. Tower Support

Towers will rest on solid foundations. Ensure that the towers are plumb and well guyed or otherwise anchored in four directions to resist lateral movement and displacement.

j. Hinged Roof

The protective covering on top of cage or platform may be hinged to accommodate long materials being hoisted.

k. Electric Hoists

Electric hoists will be provided with an automatic motor brake to stop and hold the load in case of a power failure.

l. Operating Restrictions

One hoisting machine, or one operator, will operate only one cage, bucket, or hoist platform at a time.

m. Hoisting Machines

Design and install hoisting machines to raise and lower the maximum rated load, plus the weight of equipment and ropes. Hoisting machines will incorporate the following features:

- Brakes. The brakes must be capable of stopping and holding 150% of the rated hoisting capacity under all operating conditions.
- Mechanical Brakes. Install mechanical brakes to stop movement of the hoist drum and equip the mechanical brakes with a positive acting device that will hold the brake in the engaged position.
- Ratchet and Pawl. Equip friction-clutch-driven winding drum hoisting machines with an effective pawl and ratchet capable of holding the rated load capacity when suspended.
- Controls. All controls will, when released, automatically return to neutral and set the brake. Plainly mark each control to indicate its function; it will be within easy reach of the operator.

n. Position Indicator

Use a positive system to indicate when the hoist car or platform has reached specific locations, including the top and bottom landings.

o. Communications

Hand signals may be used on a single drum hoist when the hoist tower is no more than 50 feet high and the signals are always visible to the operator. Use audio communications on all other material hoist installations. The system will be two-way, with a speaker located at the hoist operator’s station and at each landing. The hoist operator will be able to communicate by voice to and from each station.

6. Facility Maintenance Hoisting Systems

Design, construct, install, and use hoisting systems to inspect and maintain facilities, such as penstocks, spillways, and airshafts, and for external building maintenance such as window washing, in accordance with ASSP A10.22 Safety Requirements for Rope-Guided and Nonguided Workers' Hoists for Construction and Demolition Operations, or ASME A120.1 Safety Requirements for Powered Platforms and Traveling Ladders and Gantries for Building Maintenance. The manufacturer or a qualified engineer will certify such hoisting systems for the

intended use. Hoisting systems used on an incline or other nontraditional use will undergo a peer review by an independent engineer. The review will include the structure, controls, operating procedures, and a performance test of the completed and assembled system.

Section 3.04 Mobile Cranes

1. Scope

This section sets forth safety requirements for mobile cranes the safety roles and responsibilities for Bureau of Reclamation (Reclamation) personnel and other government employees or contractors using Reclamation equipment. Reclamation Safety and Health Standard (RSHS) Section 3.03, Permanently Installed (Fixed) Cranes, covers safe practices for permanently installed cranes. Section 3.03, Appendix 3.03-A, Riggers and Signalpersons, covers rigger and signalpersons requirements. Section 3.03. Appendix 3.03-B, Hoists, covers safe hoisting practices.

2. General Requirements

The American Society of Mechanical Engineers (ASME) B30 standards and the Occupational Safety and Health Administration (OSHA) regulations 1910 Subpart N and 1926 Subpart CC govern mobile crane use. Reclamation Facilities Instructions, Standards, and Techniques (FIST) 4-1A, Maintenance Scheduling for Mechanical Equipment, covers the maintenance, operation, inspection content and requirements, removal from service, record keeping for inspection and testing, load testing, equipment design, performance, and modification.

3. Responsibilities

a. Regional Safety Managers

- Shall conduct periodic reviews of local mobile crane safety programs as a part of their normally scheduled safety and occupational health program evaluations.

b. Area Office Managers

- Shall designate a qualified evaluator, or third-party evaluator, to assess operators, signalpersons, and riggers on Reclamation's behalf.

c. Area Office Safety Professionals

- Shall review critical lift plans.

d. Facility Managers

- Shall select qualified personnel to maintain and repair mobile crane equipment and components.
- Shall ensure proper maintenance, testing, and repair/replacement of equipment by qualified personnel and will make the respective documentation available for review.
- Shall ensure mobile crane equipment have preventive maintenance schedules established, as well as detailed and accurate maintenance job plans are prepared in accordance with FIST4-1A, Maintenance Scheduling for Mechanical Equipment.

- Shall ensure maintenance and repair personnel follow applicable safety procedures and have the tools and documentation, including equipment manuals, necessary to accomplish their work.
- Shall verify that a third-party evaluator or qualified person evaluates equipment operators, signalpersons, and riggers.
- Shall verify that a qualified inspector or third-party evaluator completes crane inspections, per paragraph 3.04.7.b, Crane Inspections, of this section.

e. First-Line Supervisors

- Shall provide or coordinate mobile crane operator training to ensure operators under their supervision meet the requirements set in 3.04.4, Training Requirements, of this section.
- Shall document the operator evaluation to include the name of the certifying organization; operator's name; evaluator's name and signature; date of the evaluation; and the make, model, and configuration of the equipment used in the evaluation.
- Shall make the operator evaluation documentation available digitally or on the worksite for as long as the operator is employed.
- Shall provide or coordinate retraining and re-evaluation if an operator is not competent in a necessary aspect of safe crane operation.
- Shall determine if a load is a critical lift and designate someone other than the crane operator to supervise the planning and execution of the critical lift (see paragraph 3.04.6.f, Critical Lifts, of this section) per FIST 4-1A, 6.9.3, Designated Person.
- Shall develop a job hazard analysis (JHA) and ensure that all staff follow the JHA for all crane assembly/disassembly, inspection, maintenance, hoisting, and rigging operations.
- Shall ensure all staff operate equipment safely.
- Shall ensure all staff use preplanned and approved hoisting and rigging instructions when necessary, and always for critical and engineered lifts.
- Shall ensure all operators resolve or properly tag equipment problems if found to be unsafe or requiring restrictive use.
- Shall assign a qualified lift supervisor to critical lift operations.
- Shall ensure any signalpersons are qualified and trained for the task assigned, prior to giving any signals.
- Shall provide crane operators the time and resources necessary to receive required medical surveillance examinations.
- Shall maintain an inventory of their employees who are qualified mobile crane operators, signalpersons, and riggers. Inventory shall include dates of training and/or certification, retraining where required, and dates of medical clearance.

f. Lift Supervisors for Critical Lifts

- Shall be designated by the first-line supervisor as the person to supervise the planning and execution of the critical lift.

- Shall ensure that all members participating in the critical lift completely understand the work instruction and any revisions to those instructions for the critical lift.
- Shall ensure qualified persons perform the activities listed in FIST 4-1A, 6.9, Critical Lifts.

g. Mobile Crane Operators

- Shall complete all training, designations, and evaluations for the skills, knowledge, and ability to recognize and avert risk for operating the specific type of crane or device they will be operating.
- Shall ensure that equipment is current on all inspections prior to lifting and ensure that all members participating in a lift completely understand the work instruction for the lift.
- Shall not assume the role of a qualified rigger, unless specifically trained and qualified as a rigger, as a certified operator does not necessarily meet the requirements of a qualified rigger.
- Shall visually inspect equipment prior to or during each shift when the equipment is in use, per paragraph 3.04.7.b, of this section.

h. Signalpersons

- Shall be trained and qualified prior to giving any signals.
- Shall agree upon and understand communication signals and radio standards with the mobile crane operator and other personnel involved.

i. Riggers

- Shall participate in assembly/disassembly activities, and, whenever workers are within a fall zone, hooking/unhooking/guiding a load or performing the initial connection of a load to a component or structure.
- Shall perform the duties commensurate with their level of certification or qualification, including assembly/disassembly of rigging, inspection of rigging prior to lift, hooking/unhooking and guiding a load.
- Shall understand and familiarize themselves with RSHS Section 3.02, Slings, Rigging Hardware, and Wire Rope.

j. Crane Inspectors

- Shall inspect cranes prior to initial use and any equipment that has had professional engineer-approved modifications or additions which affect the safe operation of the equipment or capacity, per paragraph 3.04.7.b, of this section.
- Shall inspect equipment on an annual basis per 29 CFR 1926.1412(e) and (f).

k. Crane Maintenance and Repair Persons (Reclamation Employee)

Shall only operate equipment to the extent necessary to perform maintenance, inspect equipment, or verify performance.

l. Designated Evaluators (Reclamation Employee)

- The area office manager shall designate evaluators based on qualifications of knowledge, training, and verifiable experience.
- Shall evaluate the skills, knowledge, experience, and ability of mobile crane operators, signalpersons, and riggers to recognize and avert risk when performing their respective duties.

4. Training Requirements

a. Initial

- Mobile Crane Operators. First-line supervisors shall provide training for operators-in-training through a combination of formal and practical instruction so that they may develop the knowledge, skills, and abilities to recognize and avert risks associated with equipment and tasks. Operators-in-training may only operate equipment under supervision of a certified crane operator. Training shall include:

    - 29 CFR 1926 Subpart CC and the associated Appendix C,
    - safe operation of specific type(s) of equipment they will be operating (e.g., controls and operation, use and calculation of load/capacity information for various configurations of the equipment),
    - technical knowledge of surfaces operating on,
    - equipment manuals,
    - inspections,
    - operational and maneuvering skills,
    - load chart application,
    - procedures for preventing and responding to powerline contact,
    - safe shut-down procedures, and
    - electrical safety.

- Crane Inspectors. An accredited organization or qualified in-house resource shall provide training and certification and shall include information specific to the type of mobile crane(s) to be inspected.
- Riggers and Signalpersons. Refer to Appendix 3.03-A of this section, Riggers and Signalpersons, for requirements.

b. Proficiency Qualification for Mobile Crane Operators

In accordance with 29 CFR 1926.1427, the following elements must be in place before operating mobile cranes:

- trained for the specific type of crane they will be operating,
- certified by either the National Center for Construction Education and Research or the National Commission for the Certification of Crane Operators,

- be evaluated by a qualified evaluator, and
- medically cleared.

Exception is recognized for operation of derricks, side boom cranes, and equipment with a maximum manufacturer rated lifting capacity of 2,000 pounds or less.

c. Refresher/Recertification

Mobile crane operators shall be re-certified every 5 years which shall include both a written and practical examination. First-line supervisors shall provide or coordinate retraining for staff based on their performance, and/or if there is any indication that retraining is necessary. First-line supervisors shall re-evaluate riggers every 5 years to verify skill and identify need for more extensive training.

d. Recordkeeping

The first-line supervisor will keep a list of operators, riggers, and signalpersons up to date. All Reclamation training records shall be kept in the Department of the Interior official repository.

5. Hazardous Environmental Conditions

a. Wind

Outdoor crane activities shall have means for monitoring local weather conditions, including a wind speed device located where it can measure maximum wind speed for the area. The crane operator, supervisor, or qualified person all have the authority to cease operations if they identify hazardous conditions.

- Prior To Operation. Prior to setting up a lift, a reliable weather source must confirm the wind conditions. There shall be no immediate threat of wind speeds reaching 20 miles per hour (mph) or greater. Operators shall record these wind speeds at 30 feet above open ground. Cranes subjected to high winds shall have travel restraints when not in use.
- During Operations. Operators shall not conduct hoisting operations when wind speeds, including gusts, at the site reach 25 mph. At 20 mph or more, operators must evaluate wind loading on the crane for safety. This determination will be based on wind calculations per manufacturer's recommendations.
- Postponing Operation. First-line supervisors must consult manufacturer recommendations for storing the crane/boom during high-wind events. When high wind/gust conditions postpone crane operations, operators must land and secure loads, and stow cranes/booms.

b. Lightning

First-line supervisors must shut down crane and hoisting operations when lightning occurs or is forecasted within 5 nautical miles. Employees in affected locations shall cease all outside activity and seek shelter.

6. Other Safety Equipment

a. Fire Extinguishers and Maintenance

Facilities shall provide fire extinguishers and provide training specific to the type of fire extinguisher provided. Facilities and operators shall not use carbon tetrachloride extinguishers. Facilities shall install a portable fire extinguisher, with a basic minimum extinguisher rating of 10 BC, in crane cab/operator station. Facilities shall maintain and inspect portable fire extinguishers monthly per RSHS Section 1.09, Fire Prevention and Protection.

b. Lighting

Cab lighting, either natural or artificial, shall provide a level of illumination that enables the operator to observe the operating controls as well as the load and rigging when they are in operator's line of sight.

c. Self-Rescue Devices for Cab Operated Cranes

Mobile crane operators working in a cab operated crane shall have means for self-rescue in place. There should be a means of egress from cab-operated cranes to permit departure under emergency conditions.

7. Safe Practices

a. Authority to Stop Operation

Whenever there is a concern as to safety, employees must have the authority to stop work until a qualified person assures safety. Other onsite personnel will alert the operator if they believe unsafe operating conditions exist. Reclamation Policy, Safety and Occupational Health Program (SAF P01), Appendix A, Stop Work Procedures, and Appendix B, Stop Work Action Procedural Checklist, describe Reclamation stop work procedures. If the crane operator observes an adverse operating condition, the operator has the authority to suspend operations and notify the supervisor for resolution.

b. Crane Inspections

Refer to 29 CFR 1926.1412 and FIST 4-1A, 6.5, Inspections. Facilities and crane operators shall follow any part of a manufacturer's procedures regarding inspections that relates to safe operation that is more comprehensive or has a more frequent schedule of inspection than requirements of this section. Previous inspection documents produced must be available to crane inspectors.

- Initial/Startup. Operators shall perform initial/startup before initial use and when cranes have been altered in a manner that affects safe operation or load handling equipment components.
- Frequent. The operator or other qualified personnel shall inspect crane equipment, prior to each use on each shift. The inspection shall include:

    - all functional operating mechanisms for maladjustment interfering with proper operation,
    - deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems,
    - hooks with deformation or cracks,
    - hoist chains, including end connections, for excessive wear, twist, distorted or stretched links,
    - all functional operating mechanisms for excessive wear of components, and
    - rope reeving.

- Periodic. The operator or other qualified personnel shall inspect all mobile cranes in regular use monthly, or more frequently as conditions require. Inspection shall include:

    - deformed, cracked, or corroded members,
    - loose bolts or rivets,
    - cracked or work sheaves and drums,
    - worn, cracked or distorted parts,
    - excessive wear on brake system parts,
    - load, wind, and other indicators over their full range, for any inaccuracies,
    - gasoline, diesel, electric, or other powerplants for improper performance or noncompliance with safety requirements,
    - excessive wear of chain drive sprockets and chain stretch, and
    - electrical apparatus, for signs of pitting or deterioration.

- Periodic/Annual. Operators shall perform inspections annually or more frequently as conditions require by a qualified person or third-party evaluator.
- Standby Cranes. Qualified personnel shall inspect standby cranes at least semi-annually in accordance with periodic inspection requirements. Standby cranes that are returned to service, which have not been in use for more than 1 month, but less than 6 months, shall be inspected per the frequent inspection requirements as well as a thorough rope inspection. When an inspector returns equipment to use after an idle period of six or more months, it shall be inspected per the frequent and periodic inspection requirements as well as a thorough rope inspection. A thorough rope inspection shall include any types of deterioration and a certification for continued use (including date, signature of inspector, and identifier of the specific rope).

- Third-party Inspection. A third-party qualified inspector may be a Reclamation employee outside the chain of command of the crane's facility or maintenance manager. A third-party may also be a contracted person/entity that specializes in the inspection of cranes and holds the required certifications specific to the inspected type of the crane.
- Load Testing. Refer to FIST 4-1A, 6.7.2, Periodic Load Tests, and FIST 6.13.7, Testing, for additional guidance. Facilities shall conduct load tests in accordance with applicable ASME standards and manufacturer's recommendations. The load test shall be conducted prior to use when any load bearing or load-controlling component has been altered, replaced, or repaired. In accordance with RSHS Section 1.11, Walking and Working Surfaces, paragraph 1.11.9.t.(3), Additional Inspections and Tests, inspectors shall also perform load tests prior to lifting personnel in an approved Personnel Lifting Platform at 150 percent of the intended load of the personnel platform.

c. Medical Surveillance

Qualified medical personnel shall conduct medical surveillance of mobile crane operators per the Interior Office of Occupational Health and Safety, Medical Program Handbook, Crane Operators (page 215-224). Medical personnel shall conduct medical evaluations both as pre-placement for crane operators as well as every 3 years thereafter, or more frequently, as required. The employee's local HR office shall manage all medical clearances.

d. Electrical Safety

For Reclamation's electrical safety standards refer to RSHS Section 1.10, Electrical Safety Requirements. In accordance with 29 CFR 1926.404 and 1926.406, cranes shall have a disconnecting means, a limit switch to prevent passing the safe upper limit of travel, shall meet the minimum clearance, and have proper grounding. The control circuit voltage shall not exceed 600 volts for AC or DC current. The voltage at pendant pushbuttons shall not exceed 150 volts for AC and 300 volts for DC. Where a multiple conductor cable is used with a suspended pushbutton station, the station must be supported in a satisfactory manner that will protect the electrical conductors against strain. Operators shall only use pendant control boxes that prevent electrical shock and are clearly marked for identification of functions.

e. Duty Periods

Operators will not work, or be at the jobsite, more than 12 hours in any 24-hour period. The operator will not engage in any activity that will divert their attention while operating the equipment, nor will the operator leave their position while a load is suspended.

f. Critical Lifts

A critical lift is a nonroutine lift requiring detailed planning and additional or unusual safety precautions. Refer to FIST 4-1A, 6.9, Critical Lifts, for critical lift plan content, approval, pre- lift meeting, and documentation. Dependent upon the situation, the facility manager, a qualified engineer, and the area office safety manager shall review critical lift plans. The first line-supervisor to supervise the planning and execution of the critical lift shall identify the critical lift

supervisor. The designated person shall have an understanding and familiarity with the equipment, inspections, load tests (if required), and the work instruction so that they can clearly communicate and coordinate during the execution of the critical lift.

g. Engineered Lifts

Operators shall plan engineered lifts that exceed the crane's rated capacity in accordance with ASME B30. Engineered lifts shall not exceed 110 percent of the rated capacity.

h. Powerline Safety

Before assembling, operating, and disassembling equipment, first-line supervisors must determine if any part of the equipment, load line, or load could get closer than 20 feet to a power line. Before operating equipment, operators must identify the work zone by demarcating operating boundaries or must define the work zone as the area 360 degrees around the equipment, up to the maximum working radius. First-line supervisors shall contact and inform the owner of the power line of work near the power line. All employees shall assume all power lines are energized until the utility owner/operator confirms that the line has been, and continues to be, deenergized and visibly grounded.

- Power Lines Up to 350 Kilovolts. Operators and employees shall maintain a clearance of 20 feet between the power lines and the equipment's maximum operating radius. If equipment operation could get closer than 20-foot of a power line, one of the following three requirements must be met.
- Deenergize and Ground. The first-line supervisor shall confirm the owner/operator has deenergized and visibly grounded the line at the worksite.
- 20-foot Clearance. Operators shall ensure that no part of the equipment, load line, or load gets closer than 20 feet by implementing the following preventative measures:

    - conduct a meeting to review the location of the power line(s) and steps to be taken to prevent encroachment or electrocution,
    - use nonconductive tag lines, if using tag lines,
    - erect and maintain an elevated, high visibility warning line, barricade, or line of signs that are visible to the operator, and
    - at least one of the following measures: a proximity alarm, a dedicated spotter, a range control warning device, a range limiting device, and/or an insulating link/device between the load and end of the load line.

- Minimum Clearance. Qualified personnel shall determine the line's voltage and minimum clearance distance permitted under table 19B-1, in conjunction with measures listed in paragraph 3.04.7.h.(1)(b), 20-foot Clearance of this section.

TABLE 3.04-1 Minimum Clearance Distances

Voltage (nominal, kV, alternating current)	Minimum Clearance Distance (feet)
Up to 50	10
Over 50-200	15
Over 200-350	20
Over 350-500	25
Over 500-750	35
Over 750-1,000	45
Over 1,000	As established by the utility owner or engineer who is a qualified person with respect to electrical power transmission and distribution.

Note: kV=kilovolts. Where it is determined infeasible to do the work without breaching the minimum clearance distance, see 29 CFR 1926.1410(c).

- Voltage Information. The utility owner or operator shall provide voltage information within 2 working days of the employer's request as required by 29 CFR 1926.1407(e).
- Communications/Transmitter Tower. Operators shall deenergize the transmitter where equipment is close enough for an electrical charge to be induced.
- Specific Training. Each operator and crew member who works adjacent to power lines shall be trained on 29 CFR 1926.1408 through .1411, as well as the following:

    - procedures to follow in the event of electrical contact with a power line,
    - electrocution hazard created if the operator simultaneously touches the equipment and the ground,
    - importance of the operator staying in the cab unless there is an imminent danger of fire, explosion, or another emergency,
    - safe evacuation methods for exiting the cab,
    - danger of the potentially energized zone around the equipment (step potential),
    - danger of the crew approaching the equipment or touching the equipment or load,
    - safe clearance distances, and
    - the presumption that all power lines are energized.

TABLE 3.04-2 Minimum Clearance Distance While Traveling with No Load

Voltage (nominal kV alternating current)	While Traveling—Minimum Clearance Distance (feet)
Up to 0.75	4
Over 0.75-50	6
Over 50-345	10
Over 345-750	16
Over 750-1,000	20
Over 1,000	As established by the utility owner or engineer who is qualified with respect to electrical power transmission and distribution

- Restriction of Lifting Personnel. Unless there is a specific variance issued in accordance with the RSHS and meeting OSHA defense for infeasibility or increased safety in its reasoning, no person may ride loads, blocks, buckets, hooks, scaffolding, boatswain's chairs, cages, or other devices attached to hoist lines, booms, or attachments of any crane, derrick, or materials hoist. Designated maintenance personnel may ride the carriage service platform of a cableway to perform inspection testing or maintenance. Operations using crane-supported personnel platforms are considered critical lifts. Employees may only ride in/on a personnel platform specifically manufactured for lifting personnel. Refer to RSHS 1.11, Walking and Working Surfaces, paragraph 1.11.9.q, Crane-Supported Personnel Platforms, for crane-supported personnel platform guidance.
- Moving Mobile Cranes. Operators shall not move mobile cranes when employees are aloft and shall carefully observe the area when moving a crane. Operators must observe state requirements regarding special license to drive mobile cranes on roads.
- Cranes with Capacity of 2,000 Pounds or Less. Cranes and hoisting equipment with maximum rated lifting capacity of 2,000 pounds or less shall comply with 29 CFR 1926.1441, Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less. Inspection and use of this equipment shall comply with manufacturer instructions, recommendations, limitations, and specifications. If this documentation is not available, first-line supervisors shall consult a qualified engineer who is familiar with the type of equipment. Facility Managers are responsible for providing training to operators and signalpersons for use of mobile cranes with capacity of 2,000 pounds or less.
- Modifications. Any modification or repair to a mobile crane shall have a qualified engineer to oversee, inspect and approve all changes per 29 CFR 1926.1412(a), prior to initial use.

8. Mobile and Locomotive Cranes

In addition to the safe practices previously listed, mobile and locomotive cranes will conform to the manufacturer's instructions, 29 CFR 1910.180, Crawler locomotive and truck cranes, and the current edition of ASME B30.5, Mobile and Locomotive Cranes. Side boom wheel or crawler tractors will conform to ASME B30.14, Side Boom Tractors. Articulating boom cranes will conform to ASME B30.22, Articulating Boom Cranes.

a. Operating Instructions

All equipment shall have rated load capacities, recommended operating speeds, special hazard warnings, and instructions conspicuously posted. Instructions or warnings will be visible to the operator while at the control station.

b. Boom Angle/Radius Indicator

Manufacturers shall equip mobile cranes with a boom angle or radius indicator located within the operator's view.

c. Boom Stops

Work sites shall provide cranes or other hoisting devices with cable-supported booms with stops to resist the boom falling backwards. Facilities and manufacturers shall design boom stops to provide increasing resistance from the initial point of contact to a stopping point no more than 87 degrees above horizontal.

d. Boom Hoist Disengagement Device

Manufacturers shall provide mobile crane booms with a functional boom hoist disengagement device that will automatically stop the boom hoist mechanism when the boom reaches its highest-rated angle.

e. Anti-Two-Blocking Device

Manufacturers shall equip all mobile cranes with a two-block damage prevention feature or an anti-two-blocking device. Two-block damage prevention features will prevent damage to the crane or hoist line in case of a two-block condition. Anti-two blocking devices shall have automatic capabilities to disengage all crane functions in which movement can cause two-blocking. For lattice-boom cranes manufactured before 1992, two-block warning features may be used to alert the operator to an impending two-blocking condition. Reclamation prohibits cranes lacking automatic capabilities to disengage all crane functions in a two- block condition for use in critical lifts.

f. Level Indicator

Work sites shall provide a way for the operator to visually determine the levelness of the crane.

g. Jib Stops

In addition to boom stops, jibs shall have a positive stop to prevent overtopping.

h. Cab Windows

Work sites shall equip crane cab windows with safety glass or equivalent. Cab windows shall not introduce any distortion that interferes with the crane's safe operation.

i. Audible Warning Device

Mobile cranes shall have an audible warning signal device distinguishable and audible above background noise.

j. Foot Pedal Brakes

Equipment with foot pedal brakes shall have locks, except for portal and floating cranes.

k. Hydraulic Outrigger Jacks

Hydraulic outrigger jacks shall have an integral holding device (check valve).

l. Load Weighing or Similar Device

Equipment manufactured after March 29, 2003, with a rated capacity over 6,000 pounds shall have a load weighing device, load moment (or rated capacity) indicator, or a load moment (or rated capacity) limiter.

m. Outrigger/Stabilizer Position and Hoist Drum Rotation Indicators

Work sites shall equip any equipment manufactured after November 8, 2011, with an outrigger/stabilizer position sensor, or monitor if the equipment has outriggers or stabilizers and a hoist drum rotation indicator if the drum is not visible from the operator's station.

n. Securing Booms

When they are not in use, operators shall lower crane booms to the ground or otherwise secure them to prevent displacement by wind or other outside forces.

9. Tower Cranes

In addition to the safe practices previously listed, tower cranes shall conform to manufacturer's instructions, 29 CFR 1926.1435, Tower Cranes, and the current edition of ASME B30.3, Tower Cranes.

a. Design

Work sites shall construct or install all load bearing foundations, supports, and rail tracks in accordance with the crane manufacturer's instructions or a qualified engineer.

b. Crane Assembly and Disassembly

Operators or qualified personnel shall assemble and disassemble cranes in accordance with the manufacturer's instructions and ASME B30.3. These minimum requirements shall be observed:

- supervision by a qualified person,
- provided and available manufacturers or a qualified engineer's written instructions and the weights of each component, and
- development/implementation of a JHA that includes consideration of temporary guying and bracing requirements.

c. Environmental Conditions

Operators shall place the crane into its most favorable protected position to protect personnel and property when environmental conditions require lifting operations to cease.

d. Unattended Tower Cranes

Operators shall place unattended tower cranes in a weathervane configuration.

e. Limiting Devices

Where applicable, work sites shall install the following limiting devices:

- trolley limit switches to prevent trolley motion beyond predetermined points on tower crane booms,
- anti-two-block switches that cause the hoist drum to automatically stop, preventing contact between the load hook and the head block,
- load-limiting switches to avoid exceeding crane capacities, and
- limit switches and stops or buffers at each end of the tracks of track-mounted cranes.

f. Boom Angle Indicator

Work sites shall install boom angle indicators on machines having booms capable of moving in the vertical plane.

10. Derricks

In addition to the safe practices previously listed, derricks shall conform to the requirements of 29 CFR 1910.181, Derricks, 1926.1436, Derricks, and the current edition of ASME B30.6, Derricks.

a. Design

Derrick installations and equipment shall be in accordance with manufacturer's instructions, or a qualified engineer.

b. Foundation

First-line supervisors and/or operators shall ensure derricks are set on foundations designed and constructed to support the weight of the crane plus the maximum rated load.

c. Boom Angle Aid

If the derrick is not equipped with a boom angle indicator, work sites shall use a device that automatically prevents movement past the minimum and maximum allowable boom angles or mark the boom hoist cable, within the operator's view, with caution and stop marks that correspond to the minimum and maximum allowable boom angle.

11. Floating Cranes and Floating Derricks

In addition to the safe practices previously listed, floating cranes and floating derricks shall conform to the manufacturer's instructions, 29 CFR 1926.1437, Floating cranes/derricks and land cranes/derricks on barges, and the current edition of ASME B30.8, Floating Cranes and Floating Derricks.

a. Design

The manufacturer or a qualified engineer shall design and certify all floating cranes and floating derricks.

b. Rescue

Work sites shall make a rescue skiff and personal floatation devices available meeting the requirements in RSHS Section 1.07, Personal Protective Equipment.

c. Load Rating Chart

When reducing load ratings to compensate for "barge list," first-line supervisors shall provide a new rating chart. The manufacturer will rate barge-mounted cranes designed and constructed as a unit. All other barge-mounted cranes will be large enough to limit the "list" under maximum load to 5 degrees.

d. Wave Action

Operators shall suspend crane operation when wave action affects the stability of the barge.

12. Pile Driving Equipment

Equipment used for pile driving shall be designed and manufactured for that specific purpose. In addition to the safe practices previously listed, use of pile driving equipment shall conform to the manufacturer's instructions, 29 CFR 1926.603, Pile driving equipment, and 1926.1439, Dedicated pile drivers.

a. Qualifications

A qualified person shall supervise all pile driving. Only qualified persons shall operate pile drivers.

b. Site Conditions

Prior to start of operations, first-line supervisors shall thoroughly inspect the site to determine conditions that require special safety measures. Qualified personnel shall locate all underground and overhead utilities. Overhead utilities shall meet safe clearance requirements, and all underground services in the area will be rendered safe.

c. Setup

Work sites shall erect all pile driving equipment on a firm foundation. If necessary, qualified personnel shall use adequate guy lines, outriggers, thrust boards, counterbalances, or rail clamps to stabilize pile driving equipment during operation.

d. Boilers and Pressure Vessels

Boilers and pressure vessels used in pile driving operations shall conform to standards set in RSHS Section 1.15, Hand Tools, Power Tools, Pressure Vessels, Compressors, and Welding.

e. Driving Leads

Work sites shall provide pile driving equipment leads with fixed ladders and attachment points for safety harness lanyards.

f. Hose Connections

Work sites shall secure high-pressure hose connections (air, steam, hydraulic) with a whip-check device that is adequate to prevent whipping in case of disconnection.

g. Hammer

All personnel shall take adequate precautions to prevent the hammer from missing the pile. When employees work under the hammer, operators shall place a blocking device in the leads that can support the hammer. Works sites shall provide pile driver leads with stops to prevent the hammer from being raised into the headblocks.

h. Floating Pile Driving Equipment

Hulls for floating pile driving equipment shall be at least as wide as 45 percent of the height of the lead above the water. Work sites shall protect the operating deck to prevent suspended piling from swinging or drifting over the deck. Operators and qualified personnel shall evenly distribute the weight of machinery on floating pile driving equipment so that the deck is horizontal.

i. Overhead Protection

Work sites shall provide overhead protection for the operator equivalent to 2-inch planking. Works sites shall position the overhead protection in a way that does not interfere with the operator's view of the pile driver.

j. Noise Survey

First-line supervisors shall conduct a noise survey using a sound level meter, A-scale, fast response at the beginning of piledriving operations to determine a distance from the pile driver where noise levels do not exceed 85 decibel A-weighting. Employees working inside of the boundary shall always wear hearing protection when pile driving operations are conducted.

k. Preparation of Piles

As far as practicable, piles shall be prepared at a distance at least equal to twice the length of the longest pile from the pile driving equipment.

l. Moving the Pile Driver

When moving the pile driver, operators shall lower the hammer to the bottom of the leads. When not in use, operators shall block the pile driver hammer at the bottom of the leads.

m. Signals

First-line supervisors, operators, and/or other qualified personnel shall develop suitable signals for the control of the pile driving operation prior to the start of the job.

n. Cutting Piles

Operators shall not trim piles within a distance from the pile driver of twice the length of the longest pile.

o. Hoisting Piling

Operators shall use remote release shackles when possible. If not used, provide a closed shackle or other positive means of attachment. The length of the operating rope will be less than the length of the pile, and the operators will secure the rope around the pile to prevent snagging or being blown out of reach by the wind. Employees will keep clear when hoisting piles. Operators and qualified personnel shall use tag lines to control unguided piles and flying hammers.

p. Pulling Piles

Operators shall use extractors to pull piling that cannot be pulled without exceeding the safe load rating of the pulling rig. When pulling piling, the operators shall not elevate the crane boom more than 60 degrees from the horizontal.

13. Overhead and Gantry Cranes

29 CFR 1926.1438 (b) addresses the applicable standard for overhead and gantry cranes not permanently installed in a facility. Side boom cranes mounted on wheel or crawler tractors must meet all the requirements of ASME B30.14, Side Boom Tractors.

14. Helicopter Operations

Operators and aircraft will be licensed and will comply with the applicable requirements of the Federal Aviation Administration; Department of the Interior, Office of Aviation Services; ASME B30.12, Handling Loads Suspended from Rotorcraft; 29 CFR 1910.183, Helicopters; and 29 CFR 1926.551, Helicopters.

a. Briefing

Before each day's operation, first-line supervisors shall conduct a briefing for pilots and ground personnel and discuss, in detail, the plan of operation.

b. Loads

Operators shall secure suspended loads with pressed sleeves, swaged eyes, or equivalent means to prevent hand splices from spinning open or cable from loosening. Tag lines will be short enough to avoid drawing into the rotors.

c. Cargo Hooks

Job sites shall use self-locking cargo hooks equipped with a quick-release device that can be activated from the pilot's location. Electrically operated cargo hooks will have the electrical activating device designed and installed to prevent accidental operation. Job sites shall also equip these hooks with an emergency control to release the load. Operators shall test the hooks before each day's operation to ensure that they function properly.

d. Downwash

Employees shall remove or secure material and loose gear within 100 feet of the lift or delivery site.

e. Operator Responsibility

The helicopter pilot is responsible for the size, weight, and way loads are connected to the helicopter. Job sites shall not make the lift if the pilot considers it unsafe.

f. Hooking and Unhooking

Employees will not perform work under the hovering helicopter, except as necessary to hook and unhook loads. Job sites shall provide a safe means of access and egress for employees to approach the hook to engage or disengage cargo slings.

g. Static Charge
Unless ground personnel use a grounding device to dissipate the static charge, ground personnel will wear appropriate electrically rated rubber gloves.

h. Weight Limitations
The weight of the load and rigging shall not exceed the aircraft manufacturer's rating, considering altitude and ambient temperatures that exist at the time.

i. Ground Lines
Qualified personnel shall not attach hoist wires or other gear, except for pulling lines or conductors that "payout" from a container or roll off a reel, to any fixed ground structure or allow wires or other gear to foul on any fixed structure. Qualified personnel shall use only pulling lines or conductor stringing systems designed with stress release hardware located so that it protects the aircraft against overload and line entanglement with rotors.

j. Visibility
When dust or other conditions reduce visibility, ground personnel will exercise special caution to keep clear of the rotor blades and reduce the possibility of dust to the extent practical.

k. Approaching Helicopters
First-line supervisors shall permit only authorized personnel to approach within 50 feet of a helicopter with turning rotor blades. People approaching or leaving a helicopter with the blades turning will keep within full view of the pilot and assume a crouched position. Persons will stay out of the area from the cockpit or cabin rearward unless the pilot authorizes them to enter that area.

l. Radio Communication
Work sites shall provide reliable radio communication between the pilot and a designated member of the ground crew during all loading, unloading, and rigging operations.

m. Hand Signals
The signalperson on the ground will be distinguishable from other ground personnel. The aircrew and ground personnel shall review and agree upon the signal systems, both radio and hand signals, to be used prior to hoisting the load. Hand signals, where used, shall be standard "Helicopter Hand Signals" per 29 CFR 1910.183(n), Figure N-1.

15. Communication Requirements

A signalperson shall be present when the point of operation is not in full view of the crane operator, when the view in the direction of travel is obstructed, or the operator feels a signalperson is necessary. Radio communication is required if anyone involved in the lift cannot see the signalperson/flagmen/rigger/operator. Additionally, a secondary means of communication shall be used.

a. Hand Signal Standards

The signalperson shall use Standard Method hand signals, per 29 CFR 1926 Subpart CC, App A, Standard Hand Signals, unless it is infeasible, or an operation is not covered by the standard method. The signalperson, operator and lift supervisor shall review and agree upon any non-standard hand signals.

b. Radio Signal Standards

Operators shall test radio devices used to transmit signals to ensure transmission is reliable, clear, and effective. All staff shall use a dedicated radio channel shall unless the coordination or conditions of the work prohibit such use.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 3.05 Mobile Mechanized Equipment

1. Scope

This section establishes safety requirements for heavy equipment, powered industrial trucks (forklifts), aerial lifts, and mobile mechanized equipment (to include rental equipment) at all Reclamation facilities and constructions sites.

2. General Requirements

Qualified personnel must operate mobile mechanized equipment in compliance with this section, applicable Department of Transportation (DOT) regulations, and Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910 and 29 CFR 1926. See Appendix 3.05-B, Applicable Standards and Regulations, for a list of applicable reference materials.

3. Responsibilities

a. Area Office Manager

- Shall ensure qualified personnel inspect all mobile mechanized equipment, as required by this section.

b. First-Line Supervisors

- Shall provide training to employees assigned to operate mechanized equipment and ensure that employees are proficient and qualified, as required by this section.
- Shall assign only trained and qualified employees to operate mobile mechanized equipment.

c. Employees

- Shall obtain and complete all training and evaluations for the mobile mechanized equipment the employee is assigned to operate, as required by this section.
- Shall inspect and perform maintenance on all mobile mechanized equipment, as appropriate and as required by this section.
- Shall demonstrate proficiency to operate mobile mechanized equipment.
- Shall meet the physical requirements of any job that requires the operation of mobile mechanized equipment.
- Shall meet the DOT licensing requirements for on-highway operations and possess a current commercial drivers' license (CDL) and comply the applicable OSHA standards on jobsites where DOT is not applicable.
- Shall comply with applicable operating instructions, limitations, regulations, and written safety programs and plans.

d. Contracting Officer's Representative

- Shall ensure contractors complete inspections as required by this section when the contractor's mobile mechanized equipment arrives at the Reclamation site.
- Shall receive verification from the contractor that contract employees are trained and qualified for the mobile mechanized equipment the contract employee is assigned to operate, as required by this section.

4. Training Requirements

a. Initial

The initial training program requirements must consist of the following:

- a review of the operator's manual or competent trainer-prepared operational manual/handout based on information from the manufacturer, instructions by lecture, discussions, interactive computer learning, videos, or written material,
- practical, hands-on training that includes demonstrations performed by the trainer, and
- practical hands-on exercises performed by the trainee under direct observation of the trainer. Trainers shall complete a proficiency evaluation of each operator at the conclusion of the training.

Qualified trainers must conduct the training on the type of equipment the trainee will be operating on the job. When differences exist between equipment used for training and equipment being used on the job, the trainer will explain those differences, in detail, to the trainee prior to use.

b. Certification

- Industrial Trucks. Industrial truck operators must have and maintain the appropriate certifications. An evaluation of each powered industrial truck operator's performance shall be conducted at least once every 3 years.
- Commercial Driver's License (CDL). Obtain a CDL for equipment as required by local, State, and Federal requirements. For CDL requirements including drug testing, see Reclamation Safety and Health Standard (RSHS) Section 1.21, Motor Vehicle Safety.
- Heavy Equipment. Operators of heavy equipment, other than the equipment listed in paragraphs 3.05.4.b.(1), Industrial Trucks, and 3.05.4.b.(2), Commercial Driver's License (CDL), of this RSHS, do not require certification; however, the operators shall receive training in accordance with paragraph 3.05.4.a, Initial, of the RSHS and 29 Code of Federal Regulations (CFR) 1926.21(b)(2).

c. Proficiency Qualification

Mechanized equipment training shall follow the manufacturers' requirements for safe proficient operation.

d. Lack of Proficiency

First-line supervisors shall immediately stop an operator who demonstrates a lack of proficiency when operating mechanized equipment. Employees shall receive refresher training anytime an operator has been observed to operate mechanized equipment in an unsafe manner, has been involved in an accident or near-miss while operating the mechanized equipment, evaluation shows lack of proficiency, conditions in the workplace have changed that could affect safe operation, or the operator is assigned to a different type of equipment.

e. Recordkeeping

- Training Documentation. The training provider shall document initial training on all mechanized equipment to include the name of the training organization, if one is used; instructors name and signature; operator's name; date of the training; the make, model, and configuration of the mechanized equipment used in the evaluation; proficiency of operation; and any attachments included in the training. This RSHS includes Attachment 3.04-C, Heavy Equipment Operator Training Documentation Form, for use as training documentation. If the training provider uses another tool to document training, it shall capture the required information listed in this paragraph.
- Records. Reclamation shall keep records in the Department of the Interior's approved repository and manage records in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Pre-job Briefing and Planning Requirements

The first-line supervisor shall include all employees involved in a project in the pre-job briefing and planning requirements prior to starting work. The first-line supervisor and the relevant employees shall plan and review the Job Hazard Analysis (JHA) to ensure the written JHA includes appropriate procedures for job tasks. First-line supervisors shall conduct a post-job JHA review per RSHS 1.04, Work Safety Planning, paragraph 1.04.5.d.(9), Post-job JHA Review, and shall verify an employee has the proficiency to utilize the mechanized equipment to do their job, at a level sufficient to meet the hazards identified in the JHA.

6. Hazardous Environmental Conditions (Weather/Other)

Operators shall not operate mechanized equipment when hazardous environmental conditions (weather/other) will not allow for the safe operation of the equipment.

7. Personal Protective Equipment (PPE)

Operators shall wear appropriate PPE while operating mechanized equipment per the manufacturer's requirement or the hazard assessment.

8. Other Safety Equipment

Any additional safety equipment used during the operation of mechanized equipment must not impede or restrict the operation of the original safety equipment installed by the manufacturer.

9. Safe Practices

a. Unusual Equipment Configurations

- Requirements. Operators shall not use equipment in unusual configurations, those which are not addressed in the manufacturers' operations and maintenance manual, until the following information and procedural documents have been obtained or developed:

    - equipment manufacturer's written approval, and
    - after receiving no response or a negative response from the manufacturer, an evaluation and documentation from a professional engineer, who is versed in the particular type of equipment.

- Exceptions. Exceptions to these requirements include hydraulic excavating machine hoisting operations conforming with the applicable provisions in this section.
- Speeds. Operators will not operate equipment above posted speed limits or at speeds greater than those reasonable and safe considering weather conditions, traffic, road conditions, type and condition of equipment, and manufacturer's recommendations. Operators must always maintain control of the equipment and be able to stop within the clear-sight distance.
- Gears Engaged. Operators shall not operate any vehicle on a downgrade with gears in neutral or with the clutch disengaged.
- Towing. The first-line supervisor shall not permit employees to stand or walk between a towed vehicle and the towing vehicle, except when hooking or unhooking the vehicles.
- Unattended at Night. Construction project equipment left on publicly accessible roadways overnight should comply with the respective elements of the Manual of Traffic Control Devices (MUTCD), 2009 Edition, which is incorporation by reference in 1926.200(g)(2). Where work is in progress off a roadway, equipment shall be delineated by signs, cones, lights, reflectors, or lighted/reflective barricades to identify the location of the equipment.
- Unauthorized Riding. Operators shall not allow employees to ride in or on mobile equipment unless they are sitting in a seat designed and installed for that purpose.
- Securing Loads. Qualified personnel shall ensure that the trailer used to transport equipment is rated to safely handle the weight of the equipment and its attachments. Qualified personnel shall properly distribute, chock, tie down, or otherwise secure the load on every piece of mobile equipment. Operators must also secure tools and material during transport and, where possible, keep stored items and personnel in separated locations.

- Seats and Seatbelts. Operators shall not allow passengers to ride on or in equipment unless they are seated with installed seatbelts fastened. This excludes stand-up operating equipment that is not equipped with a belt-type restraint system or a fall protection system. All operators and/or employees are required to use the provided restraint system for stand-up operating equipment if one is available.
- Emergency Equipment. First-line supervisors shall provide operators of all trucks and combination vehicles operated on public roads, including all buses and vehicles carrying flammables, explosives, or hazardous materials, with emergency equipment. Operators shall carry at least 1 portable fire extinguisher, minimum 5- pound 3-A:40-B:C-rated, and a first aid kit meeting the requirements of the American National Standards Institute (ANSI) Z308.1 and RSHS Section 1.05, Medical Services and First Aid.
- Wheel chocks. Operators shall use 2-wheel chocks for each vehicle or trailer where there is a possibility that the vehicle will move or shift because of roadway conditions or loading or unloading of the vehicle or trailer, as required in 29 CFR 1910.178(k)(1), Mechanical Means to Secure Trucks.
- Fire extinguishers. Operators must ensure that all fire extinguishers on equipment are inspected and in a serviceable condition.
- Backup alarms. Operators shall ensure all Reclamation-owned bi-directional heavy equipment and rental equipment alarms are operable and audible above any background noise at the work site.
- Horns. Operators shall ensure that bi-directional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, are equipped with a horn distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained and operational.
- Overhead Powerlines Observer. An observer shall be designated for the purpose of providing timely warning for all operations where it is difficult for the operator to maintain the required minimum approach distances from overhead powerlines by visual means. The observer must be positioned to visually monitor the clearance between the equipment and the power lines. The designated observer cannot be assigned other duties that interfere with the ability to give a timely danger warning to the equipment operator.

b. Inspection Requirements

- Initial Inspection. The operator must conduct an initial inspection on all mobile equipment before conducting required onsite brake performance tests to ensure that the equipment is in safe condition per the operator's manual and that it meets the original design specifications or has been modified with manufacturer approval or professional engineer certification and the standards of this section. The operator must conduct inspections at the site and record the inspection using Appendix 3.05-A of this RSHS. A Reclamation representative must review the form, when applicable. Operators or qualified personnel

must repair and reinspect unsafe equipment before it is returned to service and/or before the brakes are tested. The operator must inspect, and document equipment exempted from brake tests before that equipment is used.

- Periodic Inspection. The operator must inspect equipment in service at the beginning of each daily work shift. First-line supervisors must keep daily inspection logs within the unit and must not place the inspected unit into service unless applicable equipment and accessories are in safe operating condition, including:

    - service brake,
    - secondary brake,
    - parking brake,
    - windows,
    - tires,
    - warning devices,
    - steering mechanism,
    - operating controls,
    - wipers,
    - defrosters,
    - coupling devices, and
    - fire extinguishers.

c. Maintenance Requirements

- Removal from Service. The operator or maintenance technician must remove equipment from service whenever an unsafe condition is detected. No employee may place the unsafe equipment back into service until it has been repaired and tested or inspected to ensure that the equipment is safe to operate.
- Repair Shutdown. The operator must shut down and secure equipment from any accidental release of hazardous energy (see RSHS Section 1.13, Control of Hazardous Energy, Lockout/Tagout), while making repairs or adjustments unless operation is essential to making the adjustments or repairs. All energy isolation devices shall be used during the repair process if required.
- Refueling. Refueling is subject to the requirements set forth in the operator's manual and in RSHS Section 3.01, Standards for Material Handling, Storage, and Disposal.
- Tire Repair. Supervisors shall provide a safety tire cage that operators shall use when inflating, mounting, or dismounting tires installed on "split rims" or rims equipped with locking rings or similar devices. Welders shall not weld on rims unless the tire has been removed. Operators shall reference the appropriate OSHA wall chart or equivalent poster when performing tire repairs:

    - OSHA Publication 3401, Tubeless Truck and Bus Tires Wall Chart,
    - OSHA Publication 3402, Tube Type Truck and Bus Tires Wall Chart, or
    - OSHA Publication 3403, Multi-piece Rim Matching Chart.

- Blocking. Operators shall block or crib equipment or parts suspended or held aloft by cables, hydraulic cylinders, slings, ropes, hoists, jacks, or manufacturer-supplied hazardous energy control devices, or lower the equipment or parts to a supporting surface before permitting employees to work in, under, or between pieces of equipment or parts.
- Brake Repair. Operators shall use a vacuum with a high efficiency particulate air filter to clean asbestos-lined brake assemblies. Operators shall not use compressed air for cleaning asbestos-lined brake assemblies. Operators shall refer to RSHS Section 2.02, Asbestos, paragraph 2.02.4.b.(2), Prohibited Work Practices, if working on asbestos-lined brake assemblies.

d. Testing Requirements

Operators shall conduct operational tests required by the manufacturer's maintenance and operational manuals at the recommended intervals, including onsite brake tests when included in operational tests for specific equipment. Operators shall appropriately log test results and make them available.

e. Requirements for On-Highway Equipment

Trucks over 10,000 lb. (GVW). Operators using tractor/trailer combinations, transmix trucks, dump trucks and buses, and self-propelled and rubber-tired truck cranes and excavators shall meet the applicable requirements of this RSHS, Appendix 3.05-A of this RSHS, and all applicable DOT requirements contained in 49 CFR 390-399, Federal Motor Carrier Safety Regulations. When on-highway equipment is used at the worksite, operators shall follow the applicable OSHA and DOT requirements.

f. Mechanized Equipment Requirements

- General. Mechanized equipment and operations must meet the requirements of this section, including Appendix 3.05-A.
- Operator Enclosure. Qualified personnel shall equip crawler tractors, loaders, or forestry machines with operator area enclosures when used in tree-clearing operations or other operations where objects may intrude into the operator's area.
- Certification of Rollover Protective Structures (ROPS) and Falling Objects Protective Structures (FOPS). First-line supervisors shall verify that the ROPS and FOPS are certified by one of the following methods:

    - manufacturer or PE's written confirmation that the structures meet required design criteria, or
    - permanent labels attached to the structure.

- Modification or Repair of ROPS and FOPS. Operators or other qualified personnel shall remove damaged or decertified ROPS and FOPS from service until the modified, repaired, or damaged ROPS or FOPS are recertified or replaced.

- Accessories. The first-line supervisor shall ensure all crawler equipment includes accessories as specified in 29 CFR 1926.601(b)(1) through 1926.601(b)(13)(ii).

g. Requirements for Off-Highway Wheel Construction Equipment

- General. Off-highway wheeled construction equipment, including but not limited to loaders and tractors, scrapers, dumpers, graders, rollers and compactors of mass greater than 3 tons, water wagons, and similar-type equipment must conform with this RSHS, applicable provisions of this section, other relevant RSHS sections, and Appendix 3.05-A.
- Braking Systems and Performance Tests. All braking systems must conform to the criteria shown in Appendix 3.05-A of this RSHS. First-line supervisors must ensure all equipment, regardless of age, includes a safe and operable service braking system, an emergency stopping (brake) system, and a parking brake system. Any equipment manufactured before 1980 must conform to the Society of Automotive Engineers (SAE) Standard under which it was manufactured. The Contracting Officer Representative (COR) or their delegated representative must verify that brake performance tests on each piece of equipment have been completed after qualified personnel perform the initial inspection. First-line supervisors will not return equipment with any failed inspection into service until corrective measures have been taken to ensure its safe operation.
- Requirements for Agricultural and Industrial Equipment. Agricultural wheeled tractors, utility wheeled tractors, and industrial equipment, including but not limited to tractors, loaders, backhoe loaders, trenchers, and similar type equipment will be designed, operated, and maintained in a safe condition. All equipment must have service and parking braking systems that can stop and hold the equipment on any surface.
- Requirements for Industrial Trucks. All industrial trucks must meet the requirements set out in 29 CFR 1910.178, Powered Industrial Trucks.
- Requirements for Aerial Lifts. Unless otherwise provided in this section, 29 CFR 1910.67(b)(1) requires that aerial lifts acquired for use on or after January 22, 1973, shall be designed and constructed in conformance with the applicable requirements of the ANSI A92.2-1969, Vehicle Mounted Elevating and Rotating Work Platforms. Aerial lifts acquired before January 22, 1973, which do not meet the requirements of ANSI A92.2-1969, may not be used after January 1, 1976, unless they have been modified to conform with the applicable design and construction requirements of ANSI A92.2-1969. Aerial equipment may be made of metal, wood, fiberglass reinforced plastic, or other material; may be powered or manually operated; and is deemed to be an aerial lift whether or not it is capable of rotating about a substantially vertical axis.
- Construction Project Design Safety Requirements.

    - Roads. All roads, including haul roads, on the project site must be designed in accordance with the requirements contained in this section. Operators shall not

move any mobile equipment on any road, accessway, or grade unless the roadway widths, grades, and curves are constructed to safely accommodate the movement of the vehicle or equipment at the speeds that are appropriate.

- Grades. Roads shall have a maximum allowable grade of 12 percent. Loading and dumping ramps are exempt from the maximum allowable 12 percent grade if all the following conditions exist:

    - the ramp grade does not exceed 25 percent,
    - the ramp grade does not exceed the manufacturer's maximum grade for the equipment,
    - the maximum grade on which the machine, when loaded to the manufacturer's specified gross weight, can be safely stopped and held,
    - acceptable machine gear range and ground speed for safely descending and stopping on the ramp have been determined by field testing or provided by the manufacturer,
    - a JHA has been developed and approved, and
    - management has approved the action.

- Loading and Dumping Ramps. This paragraph defines loading and dumping ramps as:

    - sections of haul roads immediately adjacent to loading and dumping areas and the loading site,
    - ramp sections that are less than 200 feet long, with a lower end that (1) either stops on level ground no closer than 200 feet from foot traffic or congested equipment areas, or
    - is not directly aligned to terminate into these areas, and
    - the standards found in the Mine Safety and Health Administration PH20-I-1, Roadways and Dumping Locations Inspection Handbook.

- Curves. All curves must have open sight lines and as large a radius as practical.
- Embankment Protection. Owners must construct or install berms, curbs, or barricades to prevent vehicles or equipment from overrunning the edge or the end of the embankment when a difference in road or working level exists. Owners shall construct berms or curbs to one-half the diameter of the tires of the largest piece of equipment using the roadway.
- Drainage. Owners must design roadways with a slight crown and with ditches provided to facilitate drainage.
- Posting Speed Limits. Owners must post all roads, including haul roads, with curve signs and maximum and acceptable speed limits. Owners shall limit vehicle speeds on curves to those which permit the vehicle to be stopped within one-half the minimum sight distance.

- Single-Lane Haul Roads. Owners must provide adequate turnouts on single-lane haul roads with two-way traffic. When turnouts are not practical, owners shall provide a traffic control system to prevent accidents and advise all personnel of the traffic control system and operating restrictions.
- Two-Way Haul Roads. Whenever possible, owners must design for a right-hand traffic pattern on two-way haul roads. Owners must install signs and traffic control devices to safely control travel when a right- hand traffic pattern is not feasible.
- Temporary Traffic Control Plans (TTC). The employer shall develop a TTC plan and install appropriate traffic control devices, including signal lights, signs, cones, and barricades, or provide trained flaggers to ensure the safe movement of traffic. Road Maintenance. Owners must routinely maintain all roadways, including haul roads, in safe condition and eliminate or control dust, ice, and similar hazards. Whenever dust conditions exist, owners shall provide adequate dust control equipment on the jobsite to control the dust hazard.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 3.05-A; Record of Performance—Inspection and Brake Test—Off-Highway, Wheel-Type Construction Equipment, Loaders, Dumpers, Scrapers, Graders, Tractor Water Wagons, and Similar-Type Equipment

1. General

In addition to complying with equipment manufacturer's inspection and maintenance recommendations, all nonexempt, off-highway, wheel-type construction machines including loaders, dumpers, scrapers, graders, tractor water wagons, and similar type machines must be inspected and brake tested by the owner and/or contractor: (a) prior to initial onsite operation, (b) at least once annually thereafter, and (c) whenever directed to do so by Reclamation CORs or their delegated representatives.

Such inspections and tests must be performed by the owner and/or contractor in the presence of a Bureau of Reclamation representative. The owner and/or contractor shall record the inspection on the below form. The form will then be signed and submitted to the Reclamation COR or delegated representative. Initial and periodic performance inspections and brake tests must be conducted onsite after each unit has been assembled, reassembled, and/or prepared for operation.

Manufacturer's or owner's offsite inspection and tests must not be substituted for onsite performance inspections and brake tests. Performance brake tests must not be conducted until all appropriate inspection items are found to be available and in acceptable condition. Reclamation employees are prohibited from performing equipment inspections and brake tests for the owner and/or contractors. Owners and/or contractors are required to conduct their own inspections. Reclamation employees may only verify that the inspections were completed. Bureau of Reclamation equipment operators are expected to use the "Performance Inspection Checklist" for all Reclamation-owned equipment covered by this section.

Appendix 3.05-B: Performance Inspection Checklist

Appendix 3.05-B (Reclamation-Owned and Contractor- Owned Performance Inspection Checklist—Off-Highway Wheel-Type Construction Machines) is available to print at: https://www.usbr.gov/safety/rshs/index.html

Appendix 3.05-B: Reclamation-Owned and Contractor-Owned Performance Inspection Checklist—Off-Highway Wheel-Type Construction Machines

1. General Information

Date of Test	Specifications No.:
Contractor	Subcontractor:
Description (Make and Model):	
Serial No. or Contractor's No.:	Year of Manufacture:

2. General Equipment Safety Requirements

#	Item	Description	Available/ Acceptable
1	Manufacturer's Safety Inspection & Maintenance Records	Completed manufacturer's equipment-specific inspection checklist and maintenance records. NOTE: The Reclamation CO may waive this requirement when manufacturer information is not available due to the age of equipment.	☐
2	Manufacturer's Operating & Maintenance Manuals	Shall be available for all off-highway, rubber-tired equipment covered by this section	☐
3	Reverse Signal Alarm	Ensure automatic reverse signal alarm operates properly when the equipment is placed in reverse gear and is moving in reverse.	☐
4	Audible Warning Device	Ensure all operator-controlled machines are equipped with an audible warning device having the control lever(s) within reach of the operator(s) when seated in the operating position(s).	☐
5	Head Lights	A minimum of two head lamps mounted symmetrically on the front of the equipment. Head lamps must provide adequate illumination for a distance that exceeds machine maximum stopping distance at maximum speed.	☐
6	Stop Lamps / Taillights	Two stop lamps at rear of machines for day operation, plus two tail lamps and one backup lamp for night operation.	☐

#	Item	Description	Available/ Acceptable
7	Floodlamps	Work area floodlamps for night operation, including scraper bowl lamp, motor grader blade and front lamp, bucket lamps, ripper lamps.	☐
8	Rotating Amber Lamp	One rotating amber lamp visible in all directions on motor graders, front-end loaders and similar slow-moving machines used on public or haul roads or in borrow or fill areas.	☐
9	Cabs	Cabs are provided with safety glazed windows, heaters, defrosters, windshield wipers, door restraints, and rearview mirror on bidirectional machines.	☐
10	Access	Walking surfaces are skid resistant. Platforms are provided with guardrails. Access systems incorporate a three-point support method; one foot- two hands; one hand-two feet on handholds or ladders.	☐
11	Portable Fire Extinguishers or Fire Suppression Systems	Two 2A 40 B:C extinguishers are required on vehicles transporting flammable or explosive materials. Two 2A 40 B:C extinguishers and a fixed nozzle fire suppression system are required on all diesel-powered equipment operated underground. All other equipment must be equipped with the type and number of extinguishers or suppression systems deemed necessary by Reclamation.	☐
12	Fenders	Machines with a maximum speed exceeding 15 mph shall be equipped with fenders or operator tire guards conforming to SAE J321 or devices providing equivalent protection.	☐
13	Seatbelts	Operable seatbelts conforming to criteria set forth in applicable SAE standards. Only seatbelts permanently and legibly marked or labeled with: (1) year of manufacture; (2) model and style number; (3) trademark of manufacturer, distributor, or importer; and (4) design and test data certification are acceptable	☐

#	Item	Description	Available/ Acceptable
14	Rollover Protection System (ROPS)	ROPS has a permanently attached label that certifies the structure conforms to applicable SAE standard. Non-labeled structures must not be used without a manufacturer's or PE's written confirmation that the structure meets the aforementioned criteria. ROPS showing signs of damage, repair, or modification must not be used on equipment unless recertified.	☐
15	Falling Object Protective Structure (FOPS)	Equipment shall be equipped with FOPS unless the contractor representative notes on this inspection report that the equipment will not be loaded and/or used in a manner that would subject the operator to falling material. Installed FOPS will be certified as conforming with SAE J/ISO 3449 criteria by a permanent label on the structure or the contractor has a written certification from the manufacturer or PE.	☐
16	Operator Enclosure	Tractors, loaders, or forestry machines used in tree clearing operations, winching operations, or other operations where objects may intrude into the operator's shall be equipped with enclosures conforming to SAE J1084. Equivalent protective enclosures deemed acceptable by the COR or delegated representative meet this requirement.	☐
17	Emergency Steering	Wheeled earthmoving machines such as tractors, scrapers, wheel loaders, graders, and dumpers manufactured in or after 1980 using a power steering system shall be equipped with emergency steering provisions meeting SAE J1511.	☐
18	Exhaust Systems	Engine exhaust gases are piped outside of cab and/or discharged away from operator. Exhaust pipes are guarded or insulated to protect operating and maintenance personnel.	☐

#	Item	Description	Available/ Acceptable
19	Dump Truck Safety Devices	Dump trucks of all descriptions shall be equipped with: • Trip handle or dump-body operating levers, safety latches, of an equivalent protective system for preventing accidental movement of the lever. • Permanently mounted device for preventing accidental lowering of dump body or bed during inspection or maintenance operations. • Operator protective cab shield or canopy to protect operator during machine loading or unloading operations. Machines without this protection will display a suitable warning sign directing the operator to leave the cab during the loading or unloading process.	☐

3. Brake System Requirements

All equipment shall have an effective service braking system. The service braking system must have the capability equivalent to holding the respective equipment under the following conditions:

Machine	Grade	Condition
Loaders	30%	Loaded to manufacturer's gross weight rating and distribution with bucket in SAE carry position.
Dumpers and tractor scrapers	25%	Loaded to manufacturer's gross weight rating and distribution.
Graders	30%	Cutting edge to be in the transport position.
Tractors with dozers	30%	Lowest part of cutting edge to be 18 inches above test surface

#	Item	Description	Available/ Acceptable
20	Brake Release	The service braking system shall be of the type that can be applied or released by the operator while sitting in the operating position.	☐
21	Wheel Brakes	All tractor scrapers and dumpers must have braked wheels on at least one axle of the prime mover and one axle of each trailing unit. All other machines may have only two braked wheels (one right hand, one left hand) if the system meets stopping distance requirements of part IVB.	☐
22	Brake System Power	With the equipment stationary, the service braking system's primary power source shall have the capability of delivering at least 70 percent of maximum brake pressure when the brakes are fully applied twelve (12) times at a rate of four (4) applications per minute with the engine at maximum governed speed for dumpers and tractor scrapers and twenty (20) times at the rate of six (6) applications per minute for loaders, graders, tractors with dozer, compactors, and rollers.	☐
23	Braking System Warning Device	The service braking system using stored energy shall be equipped with a warning device that activates before system energy drops below 50 percent of manufacturer's specified maximum operating energy level. The device shall be readily visible and/or audible to the operator and provide a continuous warning. Gages indicating pressure or vacuum do not meet these requirements.	☐

#	Item	Description	Available/ Acceptable
24	Emergency Stopping System	All equipment, unless exempted elsewhere, shall be equipped with an emergency stopping system capable of the following: • The emergency stopping system shall be capable of bringing the equipment to a stop within the distance and under the conditions specified in Part IV-B outlined below. • The equipment emergency system shall be capable of being applied from the operator's position. The system shall be arranged so that it cannot be released by the operator unless immediate reapplication can be made from the operator's seat to stop the machine or combination of machines. • In addition to the manual control, the emergency stopping system shall also be applied automatically. If an automatic system is used, the automatic application shall occur after the warning device is actuated.	☐
25	Parking Brake Systems	All equipment shall be equipped with a parking system capable of: • Being applied from the operator’s position. The brake must be such that it cannot be released unless immediate reapplication can be made by the operator. • The parking system, when applied, must maintain the parking performance despite any contraction of the brake parts, exhaustion of energy, or leakage of any kind.	☐
26	Accessories	Braking systems utilizing stored energy or vacuum assist devices shall be equipped with a gage that indicates the pressure or vacuum available for braking.	☐

4. Brake System Test Methods and Procedures

All off-highway, wheel-type equipment shall undergo braking performance testing.

The COR or delegated representative may exempt emergency braking systems requirements for compactors and rollers manufactured prior to 1976 if such systems are not available from the manufacturer. Additionally, compactors and rollers intended for use on 3 percent or less grades can be Reclamation exempted from brake performance test requirements.

If available, manufacturer-recommended brake testing procedures specific to the make and model of equipment may be substituted for brake testing procedures listed below. Attach documentation of manufacturer-recommended brake testing results to this completed form.

All tests shall be conducted with applicable braking systems fully charged.

Equipment failing brake tests shall not be placed into service until the parking system has been repaired and satisfactorily tested.

a. General Braking Performance Testing

Equipment will be tested under the following conditions

Machine	Condition
Loaders	Unloaded with bucket in carry position (The vertical distance from ground to centerline of bucket hinge pin, with the angle of approach at 15 degrees.
Dumpers and Tractor Scrapers	Loaded to manufacturer's gross machine weight rating and distribution.
Tractors with Dozers	Lowest part of cutting edge 18 inches above test surface.
Compactors or Rollers	Maximum fuel, oil, sprinkler system water, and ballast as actually in use when operating.
Graders	Cutting edge to be in the transport position.

Notes:

- All dynamic stopping tests shall be conducted from 20 mph, except compactor and roller stopping tests shall be conducted from 10 mph or the maximum rated speed, if less than 10 mph.
- Stopping tests shall be conducted with the transmission in the gear range commensurate with 20 mph testing speed. The power train may be disengaged prior to completing the stop. On machines using hydrostatic drives, the drive train shall be disengaged to eliminate the retarding torque of the transmission.

- Auxiliary retarders shall not be used in the test unless the retarder is simultaneously activated by the applicable brake control system.
- Stopping distances shall be measured from the point at which the brake control is applied to the point at which the machine stops.
- Means shall be provided to determine weight of equipment and stopping distances with an accuracy of plus or minus 2 percent and test speeds with an accuracy of plus or minus 5 percent.

b. Services and Emergency Braking Systems

Service and emergency dynamic braking tests shall be conducted on a level (less than 1 percent grade in direction of travel and 3 percent at right angles to travel) clean swept dry surface. The course length will be sufficient for accelerating from 0 to 20 mph (10 mph for compactors and rollers) and providing a stopping distance equal to 1-1/ 2 times that shown for the emergency braking system. Static service brake holding tests shall be conducted on the greater of 15 percent grade or maximum grade of intended travel.

Service and emergency braking systems shall have the following stopping capabilities in feet when traveling at 20 mph (10 mph for compactors and rollers):

Equipment	Equipment Weight (lbs)	Service Braking	Emergency Braking
Loaders tractors with dozers	Up to 36,000 Over 36,000 to 70,000 Over 70,000 to 140,000 Over 140,000 to 280,000 Over 280,000	45 61 75 89 111	135 183 225 267 333
Dumpers	Up to 100,000 Over 100,000 to 200,000 Over 200,000 to 400,000	59 74 96 118	153 173 202 231
Combination dumpers and dumper trains	Up to 100,000 Over 100,000 to 200,000 Over 200,000 to 400,000 Over 400,000	59 89 125 177	153 192 241 310
Tractor Scrapers	Up to 50,000 Over 50,000 to 100,000 Over 100,000 to 150,000 Over 150,000	58 73 88 102	151 170 190 209

Equipment	Equipment Weight (lbs)	Service Braking	Emergency Braking
Graders	Up to 35,000 Over 35,000 to 70,000 Over 70,000	42 54 75	126 162 225
Compactor rollers	Up to 12,000 Over 12,000 to 30,000 Over 30,000	23.7 27.4 31.1	56.5 60.2 63.9

c. Parking Brake Systems

Parking brake systems shall be tested on a dry, 15-percent grade surface. The tests must be conducted with the unit facing both up and down the slope. Once the unit is in place and the parking brake set, all other holding devices and braking systems must be released and the transmission placed in the neutral position. Any stored energy assist sources (air, vacuum, hydraulic) must be depleted. The unit must remain in this condition without movement for 5 minutes.

d. Energy Recovery Test

Energy recovery tests must be conducted as follows: Equipment shall be placed on the stopping test surface. The engine speed shall be increased to the maximum governed revolutions per minute. The system storage pressure or vacuum shall be sed to increase until gages indicate the system is at the manufactured full rated level. The brakes on dumpers and tractor scrapers shall be fully applied four times per minute for 3 consecutive minutes. During this test procedure, the pressure/vacuum gage must never read less than 70 percent of full rated reading. The brakes on loaders, graders, tractors with dozer, compactor, and rollers must be fully applied 6 times per minute for 3-1/2 consecutive minutes. During this test procedure, the gage must never read less than 70 percent of full rated reading.

5. Service Brake System Test

TYPE (air, vacuum, mechanical, hydraulic, combination)	No. of axles with brakes No. Braked Wheels R.H. L.H.
Condition of test course (surface and grade)	
Weight of equipment (manufacturer's gross vehicle weight rating—GVWR)	

Test	Satisfactory	Deficient
Pressure or vacuum maintained during braking.		
Pressure or vacuum recovery.		
Warning device for energy systems.		

Test	Satisfactory	Deficient
Stopping distance (See IV-B for acceptance criteria)		
Feet traveled – First trial:		
Feet traveled – Second trial:		
Holding performance on grade (See IV-B for acceptance criteria)		

If brake testing was conducted using manufacturer's recommendations, attach a signed copy by the contractor/equipment owner.

6. Emergency Stopping System

Type ☐ Manual Only ☐ Manual/Automatic

Test	Satisfactory	Deficient
Stopping distance (See IV-B for acceptance criteria)		
Feet traveled – First trial:		
Feet traveled – Second trial:		

7. Parking Systems Tests

See 4.c. for acceptance criteria

☐ Holds on 15% grade: Forward and Reverse

☐ Remains Applied for Five minutes: Forward and Reverse

8. Certification

TESTED/INSPECTED BY (contractor/Equipment Owner)

Signature, Title, Date

TEST/INSPECTION WITNESSED BY (Contracting Officer Representative or Delegated Official)

Signature, Title, Date

Section 4.01 Excavation Operations

1. Scope

This section establishes requirements for all excavation operations at Bureau of Reclamation (Reclamation) facilities and Reclamation activities at other facilities. This section does not cover tunnel and shaft constructions (see Reclamation Safety and Health Standards (RSHS) Section 4.02, Tunnel and Shaft Construction). Reclamation considers trenching operations 20 feet deep, or more, drilling operations and does not cover those operations in this section (see RSHS Section 4.06, Reclamation Drilling Standards).

2. General Requirements

Reclamation's excavation work plans (EWPs) shall ensure the safety of employees and members of the public while protecting public and Reclamation property. Excavations exceeding 36 inches deep, and 10 feet long, will require an EWP. All excavation work must comply with standards and regulations in Occupational Safety and Health Administration (OSHA) 29 CFR 1926, Safety and Health Regulations for Construction, Subpart P, Excavations, and the Department of the Interior (Department) Department Manual Series 27, Part 485, Safety and Occupational Health Program.

3. Responsibilities

a. Area Office Safety Professionals

- Shall review and provide the excavation planner with feedback on the EWP (see paragraph 4.01.6.b), Routine Work Site Inspection of this section).

b. First-Line Supervisors

- Shall review and sign EWPs.
- Shall review and sign Job Hazard Analysis (JHAs) for the excavation work.
- Shall ensure all employees acquire training or certification for their assigned excavation duties.
- Shall designate the qualified competent person in writing.
- Shall designate the excavation planner.

c. Competent Person

- Shall stop work and take prompt corrective measures in dangerous, hazardous, or unsafe situations.
- Shall complete required training or have experience equivalent to the requirements in paragraph 4.01.4, Training Requirements of this section.

d. Excavation Planner

- Shall prepare and update the EWP (see paragraph 4.01.6.b), after any change in conditions.
- Shall oversee initial and periodic inspections of the worksite to include inspection for changes in conditions and reported changes.

e. Pipefitters, Welders, and Site Personnel

- Shall immediately report any condition change or hazard increase to the first-line supervisor or on-site competent person.
- Shall incorporate ergonomic considerations into the work planning with the competent person and excavation planner (e.g., prolonged exposure to kneeling, bending over, awkward body positions).

4. Training Requirements

a. Initial Training

The competent person must take OSHA 3015, Excavation, Trenching, and Soil Mechanics and OSHA 7410, Managing Excavation Hazards trainings, have training in, or be able to demonstrate expertise in, the following elements:

- types of excavations,
- methods to analyze soil and other site conditions,
- determining need for protective systems,
- determining type of protective systems needed,
- analyzing protective systems for adequacy in strength and suitability, proper installation, moving of protective systems, and final removal,
- anticipating hazards that may develop at the excavation site,
- recognizing signs of developing hazards
- issuing immediate stop work authority as needed and taking immediate corrective measures,
- identifying and monitoring potential hazardous atmospheres,
- anticipating unexpected events that may cause hazardous conditions,
- types of shoring systems and the conditions that require shoring system use,
- types and configurations of shielding systems,
- determining proper location and management of spoil piles,
- ability to create a traffic control plan and plan the proper use of barricades and stop logs for vehicular hazard control,
- planning public protection,
- protecting workers and the public from hazards of excavation work and use of heavy equipment,
- conducting preliminary site investigations, and

- other knowledge deemed necessary to be qualified as a competent person.

b. Refresher Training

Refresher training is necessary when OSHA makes a change to 29 CFR 1926, Subpart P.

c. Proficiency Qualification

The first-line supervisor will consider a competent person proficient when the person demonstrates expertise in the elements of 4.01.4, Initial Training.

d. Lack of Proficiency

The first-line supervisor shall remove a competent person demonstrating a lack of proficiency from a work site. The competent person must attend refresher training and the first-line supervisor must determine when reintegration at a work site may commence.

e. Recordkeeping

Reclamation training records shall be kept in the Department's official repository.

5. Hazard Identification, Assessment, and Safety Measures

a. Soil Classification

Prior to the creation of the EWP, a competent person must conduct a soil classification and, throughout the work, evaluate the soil conditions to determine if there is a change from previous classification(s). Type A soil classifications provide the highest safety protections and do not require soil reclassification, but the competent person should still annotate this in the EWP.

TABLE 4.01-1 Soil Classification and Properties

Soil Type	Criteria	Other Considerations
Stable rock	Natural solid mineral that can be excavated with vertical sides and remains intact while exposed	-
Type A	Cohesive soil with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPA) or greater	Cannot be Type A if soil is: • fissured, • subject to vibration from heavy traffic, pile driving, etc. • previously disturbed, • part of sloped, layered system where layers dip into excavation on a slope of greater than 4:1, or • subject to other factors requiring classification as a less stable material.
Type B	Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPA) but less than 1.5 tsf (144 kPA)	Type B soil can also be: • granular cohesionless soils such as angular gravel, silt, silt loam, sand loam, and in some cases silty clay loam and sandy clay loam, • previously disturbed soils except those otherwise classified as Type C soil, • soil that meets the requirements of Type A, but is fissured or subject to vibration, • dry rock that is not stable, or • part of sloped, layered system where layers dip into excavation on a slope of 4:1, but only if the soil would otherwise be classified as Type A.
Type C	Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPA) or less.	Type C soil can also be: • granular soils including gravel, sand, and loamy sand, • submerged soil or soil from which water is freely seeping, • submerged rock that is not stable, or • part of sloped, layered system where layers dip into excavation on a slope of 4:1 or steeper. **TYPE C SOIL CANNOT BE BENCHED**

b. Locating Underground Utilities

To request approval to dig, the excavation planner shall contact underground utilities or state central utility locator services at least 2 weeks prior to the start of work. Adjust the EWP based on the results of underground utility locations.

c. Hazardous Atmosphere

Excavations may have potential for hazardous atmospheres (i.e., oxygen deficiency). First- line supervisors must keep a log of any on-site air monitoring and make it available for workers and other personnel (29 CFR 1926.651(g), Hazardous Atmospheres). The on-site competent person shall take precautions to prevent exposure to hazardous atmospheres. Precautions shall include respiratory protection or ventilation (29 CFR 1926, Subpart E, Personal Protective and Life Saving Equipment, and Subpart C, General Safety and Health Provisions).

d. Vehicular Traffic

Employees shall wear high-visibility safety apparel as outlined in RSHS Section 1.07.10.f.(1)(2)(3), Personal Protective Equipment. First-line supervisors shall provide protection to workers from vehicle hazards on and adjacent to the work site. Stop logs must be capable of preventing the work site's largest vehicle mass and momentum from entering or falling into the excavation. Barricades shall keep standard vehicles from encroaching on the excavation. Reclamation requires traffic control if the work impacts public roads or the safety of workers or visitors on private roads. The area office safety professional and/or first- line supervisor will make themselves aware of any state requirements for approved traffic control plans and/or qualified flaggers (RSHS 1.08, Signs, Signals and Barricades and RSHS section 4.09, Work Zone Safety).

e. Safe Work Positioning

Employees must stand clear of vehicles during loading or unloading. The on-site competent person must ensure vehicle drivers and equipment operators know where personnel are in proximity to vehicles and equipment. Personnel shall ensure they are working or standing where drivers and equipment operators can see them. Employees must stand away from the operational swing of heavy machinery and out of the operational zone of lifted or suspended loads.

f. Removal of Surface Encumbrances

Before excavation, competent persons must remove trees, brush, boulders, and/or other surface encumbrances which may pose a hazard.

6. Pre-job Briefing and Planning Requirements

a. Preliminary Site Inspection

In preparation for the EWP, an excavation planner must inspect the work site and adjacent areas to determine conditions and potential hazards that would require special safety measures or mitigation.

b. Routine Work Site Inspection

Based upon the EWP, the excavation planner will oversee the work of routine site inspection. The excavation planner may delegate the routine work site inspection to another competent person.

c. Excavation Work Plan

The excavation planner, with input from the competent person and other competent persons, will complete the EWP. Reclamation does not require EWPs for site grading unless there is the presence of underground utilities. The EWP must include preliminary site inspection results, soil classification, work planning, safe work release from underground utilities, site layout, public protection, traffic control, hazard identification, environmental hazards management plans, JHAs, and all other applicable details to safely conduct the excavation work. This plan will detail all phases of excavation operations including:

- details of excavation work (e.g., width, depth, type of work),
- notation of all possible safety hazards (e.g., overhead and adjacent hazards),
- mitigation plan for identified and probable safety hazards,
- designation and creation of specifications for the protective system(s),
- JHA(s),
- emergency response actions and contacts,
- locations and means of ingress and egress (see paragraph 4.01.9.g, Ingress and Egress of this section),
- a detailed site plan diagram of all activity and adjacent areas,
- requirements for hazardous atmosphere testing,
- underground utility approval dig permit,
- initial soil classification,
- spoil material pile location and pile management,
- traffic control plan,
- excavation equipment management,
- locations of excavation equipment during operations, overnighting, or during long work stops,
- swing radius and full extension radius,
- stoplogs and barricades, and
- spotter or signalman.

d. Public Protections

The excavation planner must ensure excavation operations address safety measures for public protection. The excavation planner must provide advance warning through community outreach, direct communications, and appropriate signage.

7. Hazardous Environmental Conditions (Weather/Other)

a. Rain and Stormwater Runoff

Drainage must direct rainwater away from the excavation, prevent accumulation, and must not leave the work site unless allowed by a separate stormwater management plan. Melting snow or ice can become a water hazard. The excavation planner will direct competent persons to use diversion ditches, dikes, or other means to prevent rainwater or other precipitation from entering the work site. The excavation planner must also determine how to prevent stormwater runoff from entering the work site or interfering with material spoils piles.

b. Groundwater

Employees must stop work immediately if groundwater seeps or flows into the excavation site. Work cannot resume until all the groundwater is removed and no longer flows into the excavation.

c. Wind

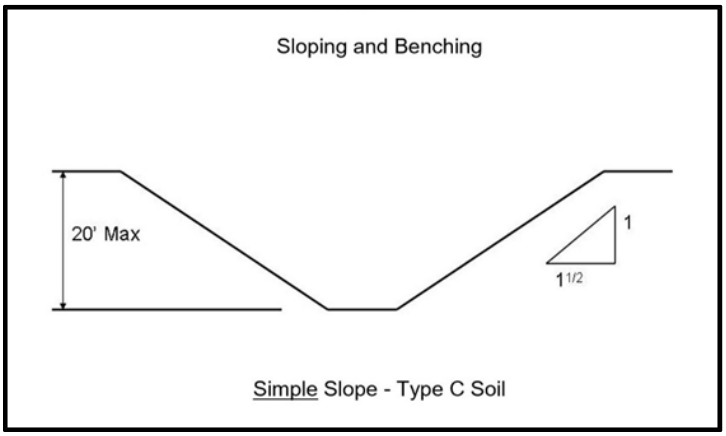
Employees must manage loose materials and spoil piles so that wind cannot blow materials in or off the work site. Blowing particles or materials must not interfere with the ability of workers to safely perform their duties.

8. Other Safety Equipment

a. Simple Sloping

Excavations 5 feet deep, or more (trenches), must have sloping or shoring. Reclamation does not require sloping or shoring when the excavation is less than 5 feet deep and an examination of the soil by a competent person provides no indication of potential for unstable slopes. Excavations less than 20 feet deep must not exceed slopes of 53 degrees for Type A soils, 45 degrees for Type B soils, and 34 degrees for Type C soils. Competent persons must measure slope from the horizontal plane and excavate to form sloping configurations for Type C soils per Figure 4.01-1.

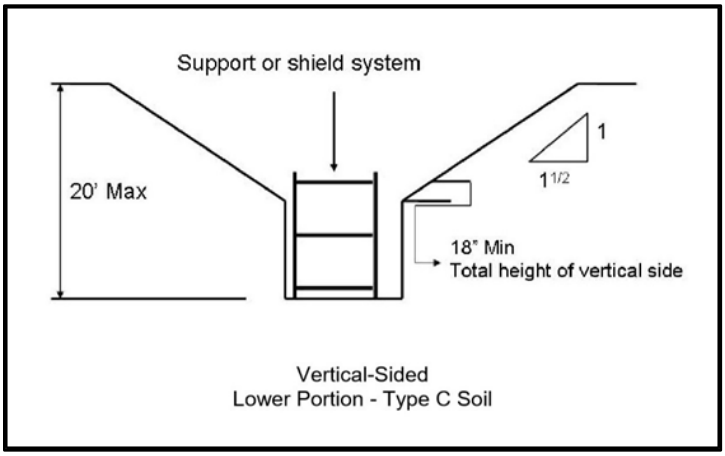
FIGURE 4.01-1 Simple Slope, Sloping, and Benching of a Type C Soil



b. Sloping with Shielding

Competent persons may use sloping in conjunction with shielding. Combination shielding and sloping systems (known as sloping with shielding) must match the Type C soil configuration found in Figure 4.01-2, below, or a registered professional engineer (PE) who specializes in sloping and shoring systems must design the sloping with shielding combination. The excavation work site will make a copy of the design readily available while constructing sloping with shielding and the design must remain available until the shielding is removed.

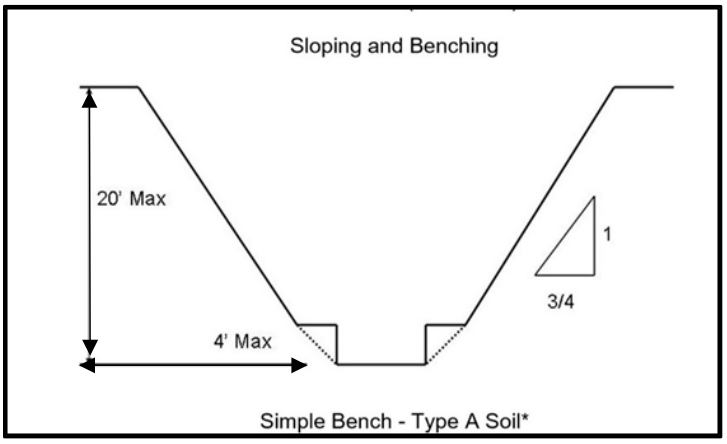
FIGURE 4.01-2 Combination Sloping with Shielding of Type C Soil



c. Simple Benching

Reclamation only allows benching for Type A or Type B soils and when excavations are less than 20 feet deep. Maximum allowable slope is ¾:1. Simple benching has a single bench cut made adjacent to the bottom of the excavation. See Figure 4.01-3, below.

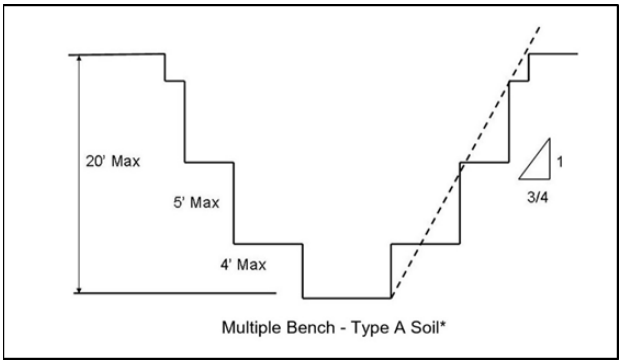
FIGURE 4.01-3 Simple Benching, Sloping, and Benching; Type A or Type B Soils



d. Tiered (Multiple) Benching

Tiered, or multiple, benching has more than one cut into the slope of the excavation. Tiered benching shall only be used in Type A soils. See Figure 4.01-4, below.

FIGURE 4.01-4 Tiered (Multiple) Benching, Type A Soil



e. Alternative Benching

A registered professional engineer (PE) with expertise in excavation operations must design the benching system or the system must follow Figures 22-3 or 22-4.

f. Shielding/Protective Systems

A registered PE with expertise in shielding/protective systems must design the systems or Reclamation must purchase a manufactured shielding/protective system. The system must be in good working order and condition, free from damage and defect, and used per the system design specifications. Competent persons within the excavation site must also install the shielding/protective system properly to restrict lateral or other hazardous movement of the shield under sudden lateral loads. The shielding/protective system must protect against hazards of cave-in or collapse during ingress, egress, and while workers are inside the system. Workers

shall not be inside the shields when competent persons install, remove, or move the shielding/protective systems.

g. Ingress and Egress

For excavations 4 feet deep or more, the excavation site must provide stairs, ramps, or ladders as a safe means of egress. Each worker must be within 25 linear feet in the direction of lateral travel to a ramp, stair, or ladder and must have at least two means of egress. If a barrier or other hazard prevents the worker from reaching the other side of the excavation easily, the excavation site must provide egress options on the same side as the worker. Ladders must extend from the bottom of the excavation to no less than 3 feet above the surface. Ramps shall be a minimum of 4 feet wide and only used for personnel. Personnel shall not use, store, or move any equipment on ingress/egress ramps (RSHS Section 1.11, Walking and Working Surfaces).

h. Soil Piles

Spoil piles must be a minimum of 2 horizontal, linear feet away from the open excavation area. The excavation site must place the spoil pile so that spalling, raveling, or sloughing will not encroach upon the open excavation area clear space. In addition, the excavation site must maintain the spoil pile to keep spoil pile materials from becoming a hazard to workers, others on the site, and the general public.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 4.02 Tunnel and Shaft Construction

1. Scope

This section sets forth requirements for tunnel and shaft construction, which includes underground tunnels, shafts, caverns, chambers, passageways, and cut-and-cover tunneling. Where this section does not provide specific definitions or instructions, it adopts, by reference, the current editions of the Federal Occupational Safety and Health Administration (OSHA) regulations.

2. General Requirements

a. Planning

All Reclamation employees must conduct tunnel and shaft construction following the requirements of this section and 29 CFR 1926.800, Underground Construction.

b. Non-Construction Activities

Reclamation employees conducting non-construction work, such as inspections and general maintenance in existing tunnels and shafts, shall follow the requirements of other applicable Reclamation Safety Health Standard (RSHS) sections to address the hazards of the non-construction activities.

c. Construction Activities

Reclamation employees conducting construction work in new and existing tunnels and shafts shall follow the requirements of this section and other applicable RSHS sections. Construction work in existing tunnels and shafts includes, but is not limited to, alterations, re-coating a penstock, re-building tunnel or shaft walls, and/or installing new equipment.

d. Contract Activities

The contracting officer shall ensure contractors comply with the safety requirements outlined in the safety specifications detailed in the contract.

3. Responsibilities

a. Project Manager

- Shall ensure the tunnel and shaft construction project is designed and operated to meet the requirements of this section.
- Shall provide rescue teams for tunnel and shaft construction projects.

b. First-Line Supervisors

- Shall provide employees working on tunnel and shaft construction jobsites with the training outlined in paragraph 4.02.4, Training Requirements, of this RSHS.

- Shall ensure the designated person required by paragraph 4.02.d.4, Designated Persons, is on duty outside the tunnel or shaft when employees are inside the tunnel or shaft.
- Shall brief the oncoming shift supervisor of hazardous conditions as required by paragraph 4.02.6, Pre-job Briefing and Planning Requirements.
- Shall ensure all communications systems are tested and in working condition.

4. Training Requirements

a. Initial

Employees engaged in tunnel and shaft construction activities shall be trained on, at a minimum, the following subjects:

- recognition and avoidance of hazards associated with underground construction activities,
- confined spaces,
- air monitoring,
- ventilation,
- electrical safety,
- illumination,
- communications,
- flood control,
- unstable ground,
- cave-ins,
- rockslides,
- mechanical equipment,
- hoisting,
- load handling,
- personal protective equipment (PPE),
- fall protection,
- hazardous materials,
- explosives,
- fire prevention and protection,
- emergency procedures,
- evacuation plans, and
- check-in/check-out systems.

b. Records

Reclamation shall keep training records in the Department of the Interior's approved repository and manage records in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Hazard Identification, Assessment, and Safety Measures

The project manager, supervisors, and employees shall develop a job hazard analysis (JHA) for all tunnel and shaft construction activities. The JHA shall meet the requirements of RSHS Section 1.04, Work Safety Planning.

6. Pre-job Briefing and Planning Requirements

Outgoing shift supervisors shall inform oncoming shift supervisors of hazardous occurrences and conditions that affected or might affect employee safety. Oncoming supervisors shall inform oncoming shifts of any hazardous occurrences or conditions that have affected or might affect employee safety, including but not limited to liberation of gas, equipment failures, earth or rock slides, cave-ins, flooding, fires, or explosions.

7. Personal Protective Equipment

The JHA shall identify PPE appropriate for tunnel and shaft construction activities. PPE shall meet the requirements of RSHS Section 8, Personal Protective Equipment.

8. Safe Practices

a. Access and Egress

- General. The project manager shall provide and maintain safe means of access and egress, meeting the requirements of 29 CFR 1926.800, to all workstations.
- Control Openings. The project manager shall control access to all tunnel and shaft openings to prevent unauthorized entry to tunnel and shaft construction areas.

b. Check-in/Check-out

The project manager shall establish a check-in/check-out procedure that will ensure above ground personnel can determine an accurate number of persons in the tunnel or shaft.

c. Communications

- General. All means of communication must meet the requirements of 29 CFR 1926.800.
- Power Supply. Powered communications systems must operate on an independent power supply and be charged at all times.
- Working Alone. The project manager shall provide an employee working alone, in a hazardous location, out of range of unassisted voice communication, and not under direct observation, with an effective means of obtaining emergency assistance.
- Testing. Supervisors and employees shall test communication systems each shift prior to tunnel and shaft entry and as often as necessary at later times to ensure the communication systems are in working order.

d. Emergency Provisions

- General. Emergency provisions must meet the requirements of 29 CFR 1926.800.
- Egress. The project manager shall, when a shaft is used as a means of egress, ensure an emergency power-assisted hoisting system is installed, tested, and ready for use during an emergency, unless the regular hoisting means can continue to function during an electric power failure at the jobsite.
- Self-Rescuer Respirators. All employees and visitors that might be trapped by harmful air environments in tunnels and shafts must use closed-circuit escape (self- rescuer) respirators approved by the National Institute for Occupational Safety and Health under 42 CFR part 84.
- Designated Person. The designated employee, stationed outside the tunnel or shaft by the first-line supervisor, is responsible for securing immediate aid and keeping an accurate count of employees in the tunnel or shaft in the event of an emergency.
- Lighting. Employees shall use a portable emergency lighting source in a tunnel or shaft, unless natural light or an emergency lighting system provides adequate illumination for escape.

e. Rescue Teams

- General. The project manager shall ensure rescue teams that meet the requirements of 29 CFR 1926.800 are provided.
- 25 or More Employees. The project manager shall ensure at least 2, 5-person rescue teams are provided when 25 or more employees are working in tunnels or shafts. One rescue team shall be on the jobsite or within half an hour travel time from the tunnel or shaft entrance. The second rescue team shall be within a 2-hour travel time from the tunnel or shaft entrance.
- Fewer than 25 employees. The project manager shall ensure at least 1, 5-person rescue team is provided when fewer than 25 employees are working in tunnels or shafts. The rescue team shall be on the jobsite or within half an hour travel time from the tunnel or shaft entrance.
- Qualified Rescue Team. The rescue team members must be qualified in rescue procedures for tunnel and shaft construction projects and must be familiar with conditions at the jobsite.

f. Hazardous Classifications

- General. The project manager shall, as necessary, assign the tunnel and shaft construction project with air environment hazardous classifications meeting the requirements of 29 CFR 1926.800.
- Potentially Gassy Operation. The project manager shall classify the tunnel or shaft as a potentially gassy operation if air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases for more than a 24- hour period, or

geological information indicates 10 percent or more of the lower explosive limit for methane or other flammable gases is likely.

- Gassy Operation. The project manager shall classify the tunnel or shaft as a gassy operation if air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases for 3 consecutive days, there has been an ignition of methane or other flammable gases, or the tunnel or shaft is exposed to air flow from a connected tunnel or shaft classified as a gassy operation.
- Equipment. The project manager and supervisor shall ensure equipment used in gassy operations meets the requirements of 29 CFR 1926.800 and 30 CFR Part 36, Approval Requirements for Permissible Mobile Diesel-Powered Transportation Equipment.
- Signs. The project manager shall post signs at each entrance to tunnels or shafts classified as a gassy operation notifying all entrants of the gassy classification.
- Ignition Sources. Smoking and ignition sources, such as matches and lighters, are prohibited in tunnels and shafts classified as a gassy operation.
- Hot Work. The supervisor shall provide a fire watch when hot work is conducted in tunnels and shafts classified as a gassy operation.

g. Air Quality and Monitoring

- General. The project manager and supervisor shall ensure air quality and air monitoring in tunnel and shaft construction projects meet the requirements of 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists, and 29 CFR 1926.800.
- Air Monitoring. A trained employee must perform air monitoring that meets the requirements of 29 CFR 1926.800 in tunnel and shaft construction projects.

h. Ventilation

- General. Ventilation must meet the requirements of 29 CFR 1926.800 in tunnel and shaft construction projects.
- Fresh Air. All tunnel or shaft work areas must have a sufficient fresh air supply to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.
- Reversible Flow. The project manager shall ensure the mechanical air flow direction is reversible.

i. Illumination

Illumination must meet the requirements of 29 CFR 1926.56, Illumination, Table D-3, Minimum Illumination Intensities in Foot-Candles, and 29 CFR 1926.800 in tunnel and shaft construction projects.

j. Fire Prevention and Control

- General. Fire prevention and control must meet the requirements of 29 CFR 1926 Subpart F, Fire Protection and Prevention, and 29 CFR 1926.800 in tunnel and shaft construction projects.

- Open Flames. The supervisor shall prohibit open flames in all tunnel and shaft construction operations except as permitted for welding, cutting, and other hot work operations.
- Portable Fire Extinguishers.
- The project manager and supervisor shall provide portable fire extinguishers throughout all tunnel and shaft construction work areas following the requirements of 29 CFR 1926.150, Fire Protection.
- Above Ground Storage. The project manager and supervisor shall locate above- ground storage of flammable or combustible materials at least 100 feet away from any access opening to any underground operation.
- Diesel Fuel. The supervisor shall allow the storage of no more than a 24-hour supply of diesel fuel in tunnel and shaft construction work areas.
- Gasoline. The supervisor shall not allow gasoline in tunnel and shaft construction project work areas.
- Hydraulic Fluids. Hydraulically actuated machinery and equipment used in tunnel and shaft construction projects must use fire-resistant hydraulic fluids or utilize a fire suppression system.

k. Welding, Cutting, and Other Hot Work

- General. Welding, cutting, and other hot work performed in tunnel and shaft construction projects must meet the requirements of 29 CFR 1926 Subpart J, Welding and Cutting, and 29 CFR 1926.800.
- Welding Gases. The supervisor shall allow no more than the amount of fuel gas and oxygen cylinders needed to perform welding, cutting, and other hot work for a 24-hour period in tunnel and shaft construction work areas.

l. Ground Support

- General. The project manager and supervisor shall ensure the area and ground around and in tunnel and shaft construction projects are protected, stabilized, scaled, and supported to meet the requirements of 29 CFR 1926.800.
- Portal Areas. The project manager shall ensure portal openings and access areas are protected by shoring, fencing, head walls, shotcrete, scaling, securing loose materials, or other equivalent protection methods for the safe access of employees and equipment.
- Inspections. A trained employee must perform inspections in tunnel and shaft construction work areas at the start of each shift and as often as necessary to determine ground stability and safe passage.

m. Blasting

Blasting operations performed in tunnel and shaft construction projects must meet the requirements of 29 CFR 1926 Subpart U, Blasting and the Use of Explosives, and 29 CFR 1926.800.

n. Drilling

- General. Drilling operations performed in tunnel and shaft construction projects must meet the requirements of 29 CFR 1926.800 and RSHS Section 4.06, Reclamation Drilling Standards.
- Inspections. A trained employee must perform inspections of drilling equipment prior to each use and the drilling area prior to start of work to identify deficiencies and hazards.

o. Haulage

- General. Haulage operations performed in tunnel and shaft construction projects must meet the requirements of 29 CFR 1926.800 and RSHS Section 3.05, Mobile Mechanized Equipment.
- Bumper Blocks. The project manager shall provide bumper blocks or equivalent stopping devices at all track dead ends.
- Equipment Hauling. The supervisor shall ensure hauled equipment is loaded and secured to prevent sliding and dislodgement.

p. Electrical Safety

Electrical systems and electrical safety in tunnel and shaft construction projects must meet the requirements of 29 CFR 1926 Subpart K, Electrical, and 29 CFR 1926.800.

q. Cranes and Hoists

All crane and hoisting operations in tunnel and shaft construction projects must meet the requirements of 29 CFR 1926.552, Material Hoists, Personnel Hoists, And Elevators, 29 CFR 1926 Subpart CC, Cranes and Derricks in Construction, 29 CFR 1926.800, RSHS Section 3.03, Permanently Installed (Fixed) Cranes, and RSHS Section 3.04, Mobile Cranes.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 4.03 Blasting

1. Scope

This section discusses blasting operations, with specific focus on the following areas:

- General Requirements
- Radio and Electromagnetic Radiation
- Transporting Explosives
- Transporting Explosives Underground
- Storing Explosives
- Handling Explosives
- Loading Explosives and Blasting Agents
- Wiring operations
- Firing explosives
- Inspection following a blast
- Misfires
- Using safety fuses
- Using detonator cord
- Underwater blasting

2. General Requirements

In addition to the requirements of this section, the transportation, handling, storage, and use of explosives are subject to provisions of ANSI A10.7 - Safety Requirements for Transportation, Storage, Handling, and Use of Commercial Explosives and Blasting Agents; 29 CFR 1910.109 - Explosives and Blasting Agents; 29 CFR 1926, Subpart U - Blasting and the Use of Explosives (29 CFR 1926.900 through 1926.914); and 27 CFR Part 55 - Commerce in Explosives.

a. Competent Supervision

A blasting supervisor must be designated to direct and supervise all blasting operations. This includes the transportation, handling, storage, and use of explosives and blasting agents. The supervisor must provide written records of past experience to the employer as evidence of competency.

b. Qualifications

- Personnel. Employees who transport, store, handle, or use explosives or blasting agents must be at least 21 years of age. They must be able to give and understand written and verbal instructions.

- Blasters. Blasters must be qualified through training, knowledge, and experience in transporting, storing, handling, and using explosives, and have a working knowledge of State and local laws and regulations which pertain to explosives. Blasters must hold a Federal, State, or local license or certificate, have proof of formal training attended within the last 5 years, or three recommendations from past employers or explosives manufacturers testifying to the blaster's knowledge and ability to perform in a safe manner the type of blasting that will be required.

c. Blasting Plan

Submit a comprehensive blasting plan before the start of blasting operations and have it approved. The blasting plan may be submitted as part of the overall site safety plan, as required by the "Contractor Requirements" section of these standards (for contract operations) or as a supplementary plan to a Job Hazard Analysis. Explosives must not be transported onto the jobsite before the plan has been approved. The plan must identify proposed methods and procedures for conforming with referenced standards and regulations, and it must include the following information:

- Method and equipment for transporting explosives and detonators
- Type and location of storage facilities
- Type and quantity of explosives and detonators
- Primer assembly procedure and location
- Employee training programs
- Provisions for protecting people, structures, and private and public property
- Provisions for developing and distributing a daily blasting plan covering hole diameter, spacing, loading, and delay patterns
- Provisions for disposal of explosives, blasting agents, and associated materials

d. Security and Inventory

Secure and protect explosives from theft. Maintain an accurate running inventory of all explosives stored at the jobsite. Such records must be available. Promptly report any loss or theft to the appropriate authorities.

e. Notifications

Notify the owners and operators of the facility and take all necessary precautions for the safe control of the blasting operations before beginning blasting operations in the immediate vicinity of buildings, public roads, overhead powerlines, utility services, or similar facilities. At least 24 hours before blasting in the vicinity of gas, electric, water, communications, or other utilities is to begin, the blasting supervisor must notify appropriate utility representatives.

f. Smoking Restrictions

Prohibit smoking, firearms, matches, open flame lamps, fire, heat-producing devices, and sparks in or near explosive storage sites or in areas where explosives are handled, transported, or used.

g. Thunderstorms

Discontinue the handling or use of explosives during the approach and progress of a thunderstorm. All employees must leave the danger areas and seek a place of safety when these conditions are present. Install an approved lightning warning device capable of detecting atmospheric conditions that could produce lightning on the jobsite. Warning devices must be acceptable to the COR or office head before installation.

h. Damage Control

Take precautions to minimize ground vibration, airblast, and flyrock. Include a damage control section in the site blasting plan that addresses these issues. Use blasting mats where flyrock damage is possible. Use modern blasting seismographs and methods to measure ground vibrations and air blast levels at designated structures or locations. Unless otherwise specified, control the blasting so that ground vibrations and airblast levels do not exceed the limits identified in table 4.03-1 and 4.03-2 below:

TABLE 4.03-1 Ground Vibration Limits[1]

Type of Structure[2]	Peak Particle Velocity (inches/second) at Low Frequency (<40 Hertz)[3]	Peak Particle Velocity (inches/second) at High Frequency (>40 Hertz)
Modern homes, drywall interiors	0.75	2.0
Older homes, plaster on wood lath construction for interior walls	0.5	2.0

Reference: Siskind, D.E., M.S. Stagg, J.W. Kopp, and C.H. Dowding, “Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting.” U.S. Department of the Interior, Bureau of Mines, Report of Investigations RI 8507, 1980.

[1] The graph in Appendix B of the above reference may be used in lieu of the limits listed in this table.
[2] For precarious structures not listed in the table, use the limits for older homes; for all other structures not listed in the table, use the limits listed for modern homes.
[3] All spectral peaks within 50 percent amplitude of the predominant frequency must be analyzed.

TABLE 4.03-2 Airblast Limits

Instrumentation	Air Blast (decibels)
0.1 hertz high-pass system	134
2 hertz high-pass system	133
5 or 6 hertz high-pass system	129
C-slow (for events not exceeding 2 seconds duration)	105

Reference: Siskind, D.E., V.J. Stachura, M.S. Stagg, and J.W. Kopp, "Structure Response and Damage Produced by Airblast from Surface Mining," U.S. Department of the Interior, Bureau of Mines, Report of Investigations RI 8485, 1980.

i. Warning Signs

Post warning signs at access points to blasting areas.

j. Destruction of Explosives

Deteriorated or damaged explosives, blasting agents, blasting supplies are prohibited. Destroy and remove these and all excess explosives from the site in accordance with the specific written instructions of the manufacturer.

k. Empty Explosive Containers

Destroy empty boxes and combustible packing materials which have contained explosives in accordance with the manufacturer's disposal procedures. If disposal is through burning, all personnel must remain at least 100 feet from the burning site once the material has been ignited and until no visible flames or smoke have been detected for 1 hour.

l. Fire

If a fire begins that involves explosives, or where the danger of the fire contacting explosives is imminent, do not fight the fire. All personnel must seek safe shelter; guard the fire area to prevent intruders.

3. Radio and Electromagnetic Radiation

All exposed to radio and/or electromagnetic radiation must take adequate precautions to prevent accidental discharge of electric blasting caps from current induced by radar, radio transmitters, powerlines, and similar sources of electromagnetic radiation.

a. Mobile Radio Transmitters

Mobile radio transmitters or cellular telephones within 100 feet of electric blasting caps or delays not in their original containers are prohibited unless de-energized and effectively locked. Post warning signs at least 36 by 42 inches in size, stating BLASTING ZONE— TURN OFF 2-WAY RADIOS AND CELLULAR TELEPHONES, on all public roads within 1,000 feet of blasting operations, using electronic detonators.

b. Non-Electric Firing Systems

If it is not possible to observe the safe clearance distances from radio frequency (RF) transmitter stations, as set forth in Institute of Makers of Explosives (IME) publication 20, "Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use Of Electric Blasting Caps," use nonelectric firing systems to blast. Electrical detonators must not be stored or used within the IME-specified distances of a transmitter station.

4. Requirements for Transporting Explosives

Transporting explosives by air, water, or on public highways must comply with the provisions of US Department of Transportation Regulations contained in 46 CFR 146-149 - Water Carriers; 49 CFR 171-177 Subchapter C - Hazardous Materials Transportation; and 49 CFR 390-397, "Motor Carriers."

a. Vehicles

Vehicles used to transport explosives must conform to the following requirements:

- They must be in good repair, with all electrical wiring completely protected and securely fastened to prevent short circuits.
- They must have tight floors. Cover any exposed spark-producing metal with wood or other non-sparking material to prevent contact with containers of explosives.
- Do not load them beyond rated capacity and secure the explosives to prevent shifting or dislodgment.
- Transport explosive materials in open-bodied motor vehicles only if they have been loaded into a portable magazine that is securely fastened to the truck bed. Never transport explosive materials in open-bodied motor vehicles that depend on a fire-resistant tarpaulin cover for protection.
- Mark vehicles transporting explosives with reflectorized signs on both sides and the front and rear with "EXPLOSIVES" in red letters. Make letters at least 4 inches high on a white background or placarded in accordance with 49 CFR Part 172, Subpart F - "Placarding."
- Equip them with two or more fire extinguishers with a rating of at least 2-A:40-B:C.
- Inspect them daily before use to ensure that the vehicle is in proper condition for safe transportation. The inspection must determine that fire extinguishers are charged and ready; electric wiring is protected and fastened to prevent short circuiting; chassis, motor, pan, and underbody are reasonably clean and free of oil and grease; fuel tanks and lines are secure and have no leaks; tires are in serviceable condition with proper inflation; and lights, brakes, horns, wipers, etc., are functioning properly.

b. Vehicle Operators

Motor vehicle operators transporting explosives must be at least 21 years old and be properly licensed drivers. Drivers must be physically fit, careful, capable, and reliable. Drivers must not

be unlawful users of, or addicted to, alcohol, narcotics, or dangerous drugs. Drivers must be familiar with applicable local, State, and Federal laws and regulations governing the transportation of explosive materials. Transportation on Federal highways or other public roads requires a commercial driver's license.

c. Caps and Detonators

Do not transport blasting caps and detonators with other explosives unless the blasting caps or detonators are in a closed metal storage container that has at least a 2-inch wood lining. Such containers must be at least 2 feet away from other explosives.

d. Flammable Materials

Do not transport spark-producing tools, carbides, oil, matches, firearms, acids, storage batteries, oxidizing or corrosive compounds, or flammable materials with explosives.

e. Parking

Attend vehicles containing explosives at all times. Do not park loaded vehicles, even if attended, near any bridge, tunnel, or other structure that may be occupied or locations where people may congregate or assemble.

f. Fueling

Do not refuel vehicles while they are carrying explosives.

g. Smoking Restrictions

Employees who transport, handle, or use explosives must not smoke or carry on their persons or in the vehicle matches, lighters, firearms, ammunition, or flame-producing devices of any description.

h. Riders

Permit only the authorized driver and helper to ride on trucks transporting explosives or detonators.

5. Requirements for Transporting Explosives Underground

a. Hoists

Notify the hoist operator before transporting explosives or blasting agents in a shaft conveyance. Do not permit any person to ride a hoist or shaft conveyance transporting explosives or blasting agents. Do not transport detonators while transporting explosives.

b. Powder Cars and Trucks

Convey explosives and blasting agents only in specifically built or equipped insulated powder cars or truck-mounted containers approved by the State entity having jurisdiction. Mark powder cars with reflectorized signs on both ends and sides with "EXPLOSIVES" in letters at least 4 inches high against a sharply contrasting background at all times that there are explosives in the

car. Cover or remove the signs when no explosives are present. Do not transport explosives or blasting agents on a locomotive; at least two car lengths must separate the locomotive from the powder car. Pull (do not push) powder cars.

c. Common Transport of Detonators and Explosive Materials
Physically separate compartments for transporting both detonators and explosive materials in the same conveyance or car by at least 24 inches or by a solid partition at least 6 inches thick. Do not transport detonators and other explosive materials together in any shaft-conveyance.

d. Transportation of Personnel and Explosives
No personnel, other than the transport operator, helper, and the individuals handling the explosives may ride transports carrying explosives.

e. Truck Transportation
Trucks transporting explosives underground must meet other applicable provisions of these standards and have their electrical systems checked weekly to detect possible electrical hazards. A written record of such inspections must be maintained. Auxiliary lights on truck beds powered by the truck's electrical system are prohibited. Do not store explosives in trucks.

f. Transporting Explosives to the Face or the Loading Area
Take only the quantity of explosives or blasting agents estimated necessary for the blast to the face or loading area. Take explosives or blasting agents to the loading area only after the drilling has been completed and the holes are ready to be loaded. Remove surplus explosives and blasting agents from the area before wiring up the blast.

g. Makeups
Make up primers and delays at the face or loading area unless a primer-makeup plan is submitted and approved.

6. Explosive Storage

a. Requirement
Store explosives and related materials in approved magazines and in accordance with the applicable provisions of the Bureau of Alcohol, Tobacco, and Firearms as set forth in 27 CFR 55, "Commerce in Explosives." Magazines must be bulletproof, rodent-resistant, weather-resistant, ventilated, and constructed to the standards of the Bureau of Alcohol, Tobacco, and Firearms, or the Institute of Makers of Explosives.

b. Magazine Location
Locate explosives magazines in accordance with the State and local laws. The COR or office head must approve the proposed sites before location or construction. Consider contractor and Government offices, shops, etc., to be inhabited buildings when determining magazine locations, quantities, and safe distances.

c. Notifications

Notify local authorities, such as law enforcement agencies and fire departments, of the type, planned quantity, and storage location on the site before bringing explosives onto a site for storage.

d. Detonators

Do not store blasting caps, electric blasting caps, detonating primers, and primed cartridges in the same magazine as other explosives or blasting agents. Locate detonator magazines at least 100 feet from magazines containing other explosives or blasting agents, if unbarricaded, and at least 50 feet away, if barricaded.

e. Combustible Materials

Do not permit smoking or open flame within 100 feet of storage magazines. Remove vegetation and combustible material within 25 feet of all magazines.

f. Security

Securely lock magazines at all times except to inspect or move explosives. Maintain an inventory of all storage and withdrawal of explosives. Inspect magazines storing explosives at least every 7 days to ensure that there has been no unauthorized entry or removal of explosives.

g. Posting

Post areas around magazines with "EXPLOSIVES" signs. Place the signs so that a bullet passing through the sign will not strike a magazine.

h. Storage

Store explosives in their original containers. Store containers of explosives with the top side up as designated on the container. Use the oldest stock of explosives first.

i. Maintenance

Promptly remove debris and combustible material from magazines. When magazine floors become stained with explosives, clean them in accordance with the explosive manufacturer’s instructions.

j. Transfer In and Out

Provide for the safe transfer of explosives in and out of magazines, including providing ramps or walkways, as necessary.

k. Storage Underground

Do not permanently store explosives underground. Temporary storage must comply with the following requirements:

- Powder Cars. Restrict temporary storage to limited supplies stored in specially designed powder cars located at least 1,000 feet from the face or blasting area. Do not permit transformers, storage of flammable materials, welding, open flame, smoking, and other ignition sources within 100 feet of the powder car.
- Posting and Lighting. Designate the storage area or siding by a red light visible in all directions, and post both ends of the powder car with a luminous sign, stating "EXPLOSIVES - NO SMOKING, FLAME, OR WELDING WITHIN 100 FEET."
- Protection. Locate or barricade the powder car to protect it from damage. Design siding or car-passes, when used for temporary storage, to protect the powder car from accidental entry by other cars and to prevent accidental entry of the powder car to the main line. The protective devices installed are subject to approval of both the employer and the State entity having jurisdiction.

7. Requirements for Handling Explosives

a. Handling Explosives

Handle explosives carefully. Do not drop, throw, or slide them. Carry detonators, primers, and other explosives in separate containers when transporting them manually. When they are not in their original containers, place them in a suitable nonmetallic container for manual transportation.

b. Removal from Containers

Remove explosives from their original containers only as needed for immediate use. Use only non-sparking tools or devices to open such containers. Dispose of empty containers and packing in accordance with the manufacturer's recommendations, or promptly burn them in an approved location.

8. Loading Explosives and Blasting Agents

a. Planning

Plan and schedule excavation so that drilling and loading operations will not conflict. Do not permit loading within 50 feet of drilling operations. Do not permit any activity, other than that which is required for loading holes, within 50 feet of loaded holes or holes that have the explosives in place, ready to load. A qualified blaster must supervise loading operations.

b. Drilling

Do not drill in an area already blasted until examining remaining "bootlegs" (holes that do not detonate full depth) for unexploded charges, as well as the total area, to make sure no unexploded charges remain. Do not insert drills, picks, or bars into bootlegs, even if examination fails to disclose explosives.

c. Loading Areas

Make boreholes ready for loading, and remove equipment and tools not used for loading from the area before delivering the explosives to the site. Isolate the loading areas with appropriate signs or temporary barricades to prohibit access by unauthorized people. While the bare holes are being loaded with explosives, exclude all personnel, other than those involved in the loading of boreholes, from the blast site.

d. Boreholes

Make boreholes large enough to permit loading of cartridges and explosives without forcing. Prime, load, tamp, and fire as promptly as possible with a minimum of exposure to personnel.

e. Tamping

Tamp only with wooden or plastic tamping poles without exposed metal parts. Non-sparking metal connectors on jointed poles are permissible. Seat cartridges by even, steady pressure, and do not tamp primers.

f. Priming

Follow the manufacturer's recommendations in priming cartridges. Make primers up only at the loading area and in quantities limited to the number required for a single round of blasting.

g. Stemming

Stem all blastholes in open work with noncombustible material to the collar or to a point that will confine the charge.

h. Extraneous Electricity

Prohibit electric conductors, electric equipment, and all sources of ignition in or adjacent to the loading area. Remove lights 50 feet from the face before starting to load in tunnels and shafts. If stray currents are suspected, thoroughly check out the area with suitable instruments. If stray currents cannot be eliminated, use nonelectrical detonators, delays, and caps.

i. Shunts

Do not remove the manufacturer's shunt from the cap leg wires until you complete loading and connect the cap into the blasting circuit.

j. Sprung Holes

Do not chamber (spring) boreholes.

k. Blasting Mats

Where blasting may expose personnel or property to injury or damage from flying material, cover the charges with blasting mats. Carefully protect the blasting circuits, and do not permit the circuits to contact steel mats.

l. Loading and Shooting

Do not leave loaded holes unattended or unprotected. If possible, fire all holes loaded on a shift during that same shift. If it is necessary to delay firing because of an emergency, isolate the area and post watchpersons to prevent entry to the area. Conduct aboveground blasting operations between sunup and sundown.

m. Pneumatic Loading Systems

Conduct the hazards from static electricity and stray currents associated with pneumatically loading boreholes with blasting agents, take the following precautions:

- Use only approved pneumatic loaders.
- Effectively ground and bond the entire system, including placers, valves, and loading hose. Ground at the face in tunnels and shafts. Do not use piping and rails to ground the system.
- Following installation of the ground, check the ground with an approved meter to ensure that the resistance is within safe limits.
- Use loading hoses of an approved, non-sparking, semiconductive material designed to maintain static electricity within safe limits.

n. Underground Use of Blasting Agent

Before using blasting agents underground, a powder technician representing the explosive manufacturer or supplier must inspect the proposed method of loading and the loading equipment. Submit written evidence of such inspection and approval of the systems.

9. Wiring Operations

a. Firing Devices

Use an electric blasting machine to fire blasts using electronic detonators. Do not fire blasts by connection to any other electrical system. Fire blasts using nonelectric detonators with a blasting machine or starting device prescribed by the detonator manufacturer. Do not use cap and fuse firing underground or in the excavation of shafts. Do not use electric blasting caps within 500 feet of energized high-voltage lines or facilities.

b. Wiring Procedure

Do not remove the manufacturer's shunt from the cap leg wires until the cap has been connected to the leadlines or to another cap in preparation for the assembly of two or more caps into a single series. When firing two or more series of caps as a series-parallel system, make sure that the caps in each series are the same in number (quantity, not delay periods), and test each series separately with an approved blasting galvanometer to: (1) ensure that the series is complete, and (2) ensure that each series has the same resistance and that the resistance is close to the calculated resistance for the series. If the first reading indicates an incomplete

circuit, locate the fault and correct it. If the second reading indicates a higher or lower resistance than calculated, correct the situation before final hookup and firing.

c. Electric Caps and Delays

All caps and delays in a shot must be made by the same manufacturer, and the number in a circuit must not exceed the capacity of the blasting machine or power source.

d. Galvanometer Testing

Make the following tests with an approved blasting galvanometer during all wiring operations:

- Test the circuit, including all caps, before connecting it to the firing line.
- Check the firing line before connecting it to the blasting machine or power source.

e. Firing Lines

Firing lines must be of sufficient current-carrying capacity but not smaller than No. 14 gauge solid copper wire or equivalent. Do not connect the firing line to the blasting machine or power source until you have completed and tested the wiring and cleared the blast area. Do not ground a power circuit used for firing electric blasting caps.

f. Connecting and Lead Wires

Connecting and lead wires must be insulated single solid wires of sufficient current-carrying capacity.

g. Power Circuit

When using a power circuit for firing, lock the firing switch in the "OFF" (open) position at all times, except when firing. Design the power circuit so that the firing lines to the cap circuit are automatically short- circuited when the switch is in the "OFF" position. Entrust the keys to the firing switch only to the blaster. In underground operations, the firing circuit must have a "lightning" gap of at least 5 feet, located between the firing switch and the source of power. Bridge the gap with a flexible jumper cord just before firing the blast.

10. Firing

a. Preparation

Before connecting the firing line to the power source, notify all personnel in the danger area of the blast and remove them to a safe area. Make satisfactory arrangements for evacuating the danger area and ensuring that no one enters the area before the blast.

b. Responsibility

The blaster must be in charge of the blasting machine or firing switch, and must connect the firing line to the firing device. The blaster must make all connections from the cap circuit back to the firing device, and the firing line must remain shorted until connected to the firing device immediately before firing.

c. Blasting Signal

Sound the following blasting signal on a clearly audible whistle, horn, or siren before each surface or underground blast:

- Blasting warning: A 1-minute series of long blasts 5 minutes before the blast signal
- Blast signal: A series of short blasts 1-minute before the shot
- All clear: A prolonged blast following inspection of the blast area

d. Posting Blasting Systems

Post blasting signals at all access points, and before each shot, post competent flagpersons at all access points to the danger area.

e. Disconnecting

Immediately following the blast, disconnect the firing line from the firing power source or blasting machine and shunt it. Lock firing switches open.

11. Inspections Following a Blast

a. All Blasts

Before the all-clear signal, the blaster must thoroughly inspect to determine if all charges have fired. The blaster must carefully check wires and search for unexploded charges.

b. Underground

In addition to the previously listed requirements, check and test the heading for adequate ventilation and safe concentrations of dusts, toxic vapors, and gases. Also, before permitting personnel in the heading, scale the face and make it safe.

c. All-Clear Signal

Sound the all-clear signal only after satisfactorily completing the inspection.

12. Requirements Regarding Misfires

If you suspect or find a misfire, keep all personnel, except the blaster and employees necessary to handle the misfire, out of the danger area. Prohibit all work in the danger area except that necessary to remove the misfire hazard. If a misfire occurs while using cap and fuse, all personnel must remain at a safe distance from the charge for at least 1 hour. If other electric or nonelectric initiating methods are used, the blasting supervisor may reduce the waiting period to 30 minutes.

a. Refiring

Refiring is the desired method of clearing misfires. The following actions are mandatory:

- For electrically fired blasts in which broken wires or faulty connections caused the misfire, make repairs, reconnect the firing line, and attempt to fire the charge.
- For misfires originally initiated by detonating cord or nonelectrical detonators, the blaster must inspect lines coming out of the holes, and if they appear to be intact, the blaster can reconnect them and attempt to detonate the misfired holes.
- In blastholes where leg wires are discontinuous or leads or detonating cord cut off, there may still be explosives in the hole that can be reprimed and fired. Remove any stemming in the hole. Float stemming out with water. Place a new primer in the hole and attempt to fire the charge.

b. Removal of Explosives

This procedure must be the last resort. Perform it only when refiring has failed or when refiring would present a hazard. Remove explosives by washing them out with water, or, if the misfire is underwater, blow them out with air.

c. Work Restrictions

Do not permit drilling, digging, or picking until: (1) you have detonated all missed holes or removed the explosive, and (2) the blaster has approved the resumption of work.

13. Requirements for Using Safety Fuses

Use safety fuses only where sources of extraneous electricity make the use of electric caps dangerous. Do not use damaged fuse or fuse with sharp kinks.

a. Capping

Before capping a safety fuse, cut a short length from the end to ensure a fresh-cut end in each blasting cap.

b. Crimper

Use cap crimpers of approved design for attaching blasting caps to safety fuse.

c. Length of Fuse

The minimum length of safety fuse must be as required by State law, but it must not be less than 30 inches. Provide the blaster sufficient time to permit the blaster to reach a place of safety.

d. Multiple Cap and Fuse Use

At least two blasters must be present when multiple cap fuse blasting is done by hand lighting methods. Each blaster must light no more than 12 fuses when using hand-lighting devices.

e. Mudcapping

Do not use cap and fuse to fire mudcap charges unless you separate the charges sufficiently to prevent one charge from dislodging other shots in the blast.

14. Use of Detonating Cord

a. Care in Use

Use only detonating cord consistent with the type and physical condition of the borehole, stemming, and the type of explosive. Consider and handle detonating cord in the same manner as other explosives.

b. Installation

Cut the line of detonating cord extending out of a borehole or from a charge from the supply spool before loading the remainder of the hole or placing additional charges. All runs must be free of loops, sharp kinks, or angles that take the cord back toward the oncoming line of detonation.

c. Connections

Detonating cord connections must be competent and positive and in accordance with approved and recommended methods. Make knot-type or other cord-to-cord connections only with detonating cord in which the explosive core is dry. Inspect connections before firing.

d. Use of Delays

When using detonating cord millisecond-delay connectors or short-interval-delay electric blasting caps with detonating cord, follow the manufacturer's recommendations.

e. Connecting Blasting Caps

When connecting blasting caps to detonating cord, tape or otherwise attach the cap securely along the side or the end of the cord, with the end of the cap containing the explosive pointed in the direction in which the detonation is to proceed.

f. Detonators

Do not bring detonators for firing the trunkline to the loading area, and do not attach the detonating cord until everything else is in readiness for the blast.

15. Underwater Blasting

a. Supervision

A competent blaster must conduct all blasting operations. Do not fire any blast without that person’s approval.

b. Loading Tubes

Do not use loading tubes and casings of dissimilar metals for electric or other stray-current-affected detonators or explosives. When tubes are necessary, load these electrically affected devices through nonsparking loading tubes.

c. Detonators

For underwater blasting operations, use only water-resistant blasting caps and detonating cord or other detonators and/or firing systems and methods approved by the manufacturer.

d. Marking Charges

When placing more than one charge underwater, attach a float device to an element of each charge so that it will be released by the firing. Handle misfires using precautions and procedures in this section.

e. Blast Warning

In addition to the standard audible blast warning, display blasting flags.

f. Boats in Area

Do not fire blasts while any vessel underway is within 1,500 feet of the blasting area. Notify those onboard vessels moored or anchored within 1,500 feet before the blast is fired.

g. Swimming and Diving

Do not fire blasts when swimmers or divers are in the vicinity and exposed to injury from the blast.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 4.04 Concrete, Masonry, and Framework

1. Scope

This section establishes safety requirements for concrete, masonry construction, and formwork. Additionally, this section outlines safety as it relates to the topics of concrete conveyance, formwork and falsework, shoring, precast concrete, and masonry work. Civil flatwork concrete (unless used as a foundation) does not need to adhere to the professional engineering design requirements contained in this section but is subject to all relevant safety requirements. The Reclamation Concrete Design Manuals specifically address design and construction related to the work outlined in this section.

2. General Requirements

All concrete and masonry work must comply with applicable standards and regulations from the Occupational Safety and Health Administration (OSHA) 29 CFR 1926 Subpart Q, Concrete and Masonry Construction, and the American National Standards Institute (ANSI)/American Society of Safety Professionals (ASSP) A10.9-2013 (R2018), Safety Requirements for Concrete and Masonry Work.

3. Responsibilities

a. Area Office Safety Professional

- Shall review and provide feedback on the work plan (see paragraph 4.04.5, Pre-Job Briefing and Planning Requirements).

b. Professional Engineer (PE)

- Shall design and certify all concrete conveyance systems, concrete pumping systems, booms and boom supporting structures or equipment placement, boom mountings, concrete pumps, formwork or vertical shoring installations, precast concrete temporary shoring and bracing systems, and lift-slab operations as safe for intended use.

c. First-Line Supervisors

- Shall review work plans.
- Must create and seek approval of a Job Hazard Analysis (JHA) prior to performing this work.
- Shall review and sign JHAs and Risk Analysis or Exposure Assessment forms.
- Shall supervise, or ensure supervision of, all employees by an individual(s) competent in performing the assigned duties.

d. Employees

- Shall report any change in conditions or hazards to the first-line supervisor or the job lead.
- Shall coordinate with the first-line supervisor to incorporate ergonomic considerations into the work planning, particularly any work that includes prolonged exposure to kneeling, bending, squatting, or other awkward body positions.

4. Hazard Identification, Assessment, and Safety Measures

a. Vertical Work

Employees must establish a limited access zone for vertical work, or masonry wall work, prior to the start of construction. The zone must be equal to the height of the wall, plus 4 feet, running the entire length of the vertical work. Additionally, employees must establish the zone on the un-scaffolded side, restrict access to only personnel actively engaged in or supervising the work, and maintain the zone until the vertical work is self-supporting and fully cured or is supported to prevent overturning and collapse. All vertical work over 8 feet in height shall have bracing on both vertical sides until permanent supporting elements of the structure are in place.

b. Green Cutting, Concrete Sawing, or Abrasive Blasting

Employees must address and mitigate any silica dust hazards that result from green cutting, concrete sawing, or abrasive blasting (see 29 CFR 1926.1153, Toxic and Hazardous Substances – Respirable Crystalline Silica). RSHS Section 2.08, Respiratory Protection, determines protocols for employee protections against silica dust hazards.

c. Exposed Rebar

Employees must mitigate exposed rebar hazards before work begins. Exposed rebar poses catching, tripping, and impalement hazards.

5. Pre-job Briefing and Planning Requirements

a. Work Plan

The work plan will detail the phases of concrete and masonry operations. The first-line supervisor must develop the sequencing of structural prior to the creation of the work plan. The work plan must identify all possible safety hazards and plans for mitigation, including those identified in the JHA. The work plan must include clear direction on the use of Reclamation Manual Policy SAF P01 Appendix A, Stop Work Procedures. Additionally, the work plan must also include a site map with identified staging and work zones, a limited access zone for vertical work and shoring, and plans for erection and removal of formwork, shoring, and vertical work.

b. Job Hazard Analysis

The first-line supervisor must create a JHA for specific tasks (e.g., formwork, pouring, shoring, scaffolding) (see RSHS Section 1.04, Work Safety Planning for details).

c. Precast Concrete Plan

A PE must design all precast concrete operations plans. These plans shall include detailed instructions, installation drawings, clear information on delivery and staging, equipment and method for placement, support and shoring during installation, connections and couplings, and lift planning. The work plan must include the precast concrete plan as described in paragraph 4.04.5.a, Work Plan, of this section.

6. Hazardous Environmental Conditions (Weather/Other)

a. Rain and Stormwater Runoff

Drainage for precipitation at the excavation work site shall direct rainwater away from the concrete formwork and fresh pours. Employees must use diversion ditches, dikes, or other means to prevent rainwater or other precipitation from entering the work site. Employees must use safe measures to prevent stormwater runoff from entering the work site.

b. Lightning

Work shall cease if lightning is spotted or reported within 5 miles of the work site. Work may resume when lightning is no longer present within a 5-mile radius of the work site.

c. Wind

Employees must manage loose materials and spoil piles to not allow wind to blow the materials into the active work area. Blowing particles or materials must not interfere with the ability of the workers to safely complete their duties. First-line supervisors and employees must monitor wind for its hazardous effects on the stability of structures, materials, and workers. Blowing particles or materials shall not interfere with the ability of workers to safely complete duties.

7. Personal Protective Equipment (PPE)

Employees placing or finishing concrete must wear applicable PPE, the minimum requirement being long-sleeved shirts, long pants, rubber safety boots, gloves, hardhat, and eyeglasses with side shields. The job site must provide eyewash facilities at each placement or finishing operation. Employees engaged in green cutting must wear eye and face protection. Employees engaged in wet or dry abrasive blasting using silica sand must wear an approved abrasive blasting air-line respirator, heavy-duty footwear, leather or rubber gloves, face/eye protection, and hardhat.

8. Safe Practices

a. Plants and Equipment

Refer to RSHS Section 3.05, Mobile and Stationary Mechanized Equipment, for additional mechanized construction equipment requirements.

- Batching and Screening Plants. Job sites must provide concrete batching and screening plants, aggregate production plants, hoppers, bins, silos, and related equipment designed with a safety factor to prevent structural failure or collapse. Job sites must provide batching plants, aggregate plants, and conveyor systems equipped with mechanical dust control, water spray systems, and/or other acceptable means to keep airborne dust concentrations within acceptable exposure limits. Employees must comply with permit-required confined space and hazardous energy control procedures (see RSHS Section 1.12, Confined Spaces and Permit- Required Confined Spaces (2020)) when entering silos, storage bins, tunnels, shafts, or similar enclosed areas.
- Bulk Storage Bins. Bulk storage bins, containers, and silos must have conical or tapered bottoms and be able to start material flow mechanically or pneumatically.
- Loading Skips. Loading skips 1 cubic-yard or larger must have protective guardrails installed on each side as well as a mechanical device to clear material.
- Bull Floats. Where bull float handles may contact energized electrical conductors, employees must establish a hazardous energy control clearance and lock out the power to those conductors. Where bull float handles might contact energized electrical sources, the first-line supervisor must ensure the handles are nonconductive or have an insulated sheath equivalent to nonconductive materials.
- Powered Concrete Trowels. Manually-guided, powered, and rotating concrete troweling machines must have a control switch or positive mechanical release device which automatically stops trowel rotation when the operator releases the equipment handle.
- Concrete Buggies. Handles of concrete buggies must not extend beyond the wheels on either side.
- Concrete Buckets. Concrete buckets equipped with hydraulic or pneumatically operated gates, must have positive safety latches, or similar safety devices, to prevent premature or accidental dumping. Buckets must not accumulate aggregate on the bucket's top and sides. Personnel must not ride in concrete buckets or walk/stand under buckets as they are raised or lowered into position by cranes or cableways. Operators must not route elevated concrete buckets over employees. Concrete buckets with manually operated gates must contain self-closing mechanisms. First-line supervisors and employees must maintain all buckets in structurally sound condition. A PE must approve any alterations which affect structural competency.
- Transmix Trucks. Transmix trucks and concrete pumping trucks, including operating procedures, must conform with requirements set in RSHS Section 3.05, Mobile and Stationary Mechanized Equipment.

b. Masonry Construction

Employees must establish a limited access zone when erecting a masonry wall as described in paragraph 4.04.4.a, Vertical work, of this section. The supports must be able to withstand a load of at least 15 pounds per square inch.

- Equipment. Employees must only use masonry saws with semicircular guard-enclosures over the blade and a slotted horizontal hinged bar mounted underneath the guard enclosure to retain fragments of shattered blades. Employees must use saws equipped with dust-control systems or provisions for wet sawing to control airborne dust concentrations.
- Scaffolding. Masonry scaffolding shall have a loading capacity, at a minimum, of 50 pounds per square foot (psf). Scaffolding shall comply with RSHS Section 1.11, Walking and Working Surfaces. Facilities or job sites must provide guardrails, safety nets, or personal fall protection systems for employees working 4 feet or more above any ground or adjacent working surface.

c. Concrete Conveyance Systems

The manufacturer, or a PE, must design and certify all concrete conveyance systems and supporting equipment as safe for intended use. Only competent personnel shall assemble, operate, maintain, inspect, and test the systems in accordance with requirements set forth in the manufacturer's instructions, PE's specifications, or the standards found in this RSHS section. Facilities or job sites must protect all operating platforms with guardrails and must guard all dangerous moving parts.

d. Reinforcing Steel

- Lateral Supports. Employees must laterally support reinforcing steel for walls, piers, columns, and similar structures to prevent overturning or collapse. The lateral supports for reinforcing steel must be able to withstand the forces applied during construction.
- Rigging. Employees must securely tie bundles of reinforcing steel together before moving by crane or cableway to prevent slipping. Employees must use two-part slings to handle steel more than 20 feet long. See RSHS Section 3.02, Slings, Rigging Hardware, and Wire Rope.
- Impalement. First-line supervisors or employees must eliminate the hazard of impalement by covering exposed rebar. Plastic cap coverings are not sufficient impalement protection. Employees must cover vertically protruding rebar with wood troughs or other substantial material.
- Positioning Device Systems. Employees must use a positioning device when working in a stationary location 4 feet, or higher, above any adjacent work surfaces or when placing and tying reinforcing steel in walls, piers, columns, etc. Employees must use a personal fall arrest system when moving on reinforcing steel higher than 24 feet above adjacent surfaces.
- Walkways. Reinforcing mats used as walkways must have planking to ensure safe footing.
- Prohibited Uses. Employees will not use reinforcing steel as guy attachments at any anchorage points for scaffolding hooks, stirrups, or as a load-bearing member of any lifting device.

- Wire Mesh Mats. Employees must secure wire mesh reinforcing mats at the end of each mat to prevent recoiling and secure unrolled wire mesh on each side before cutting.
- Post Tensioning Operations. First-line supervisors must not permit employees, except those essential to post-tensioning operations, behind the jack during tensioning operations. First-line supervisors or qualified personnel must erect signs and barricades to limit employee access to the post-tensioning area.

e. Formwork and Falsework

In addition to the specific requirements set forth in this section, the design and erection of formwork or falsework must be in accordance with the latest edition of the American Concrete Institute 347 Guide to Formwork for Concrete, the American Concrete Institute 318 Building Code Requirements for Reinforced Concrete, and the current edition of ANSI A10.9 Safety Requirements for Masonry and Concrete Work.

- Safety Factor. Employees or qualified personnel must design, erect, brace, and maintain formwork, falsework, structural shoring, and bracing to safely support all vertical and lateral loads. First-line supervisors must incorporate the minimum safety factors as specified in ANSI A10.9 in the design and erection of all framework, shoring, falsework, and formwork accessories.
- Construction Loads. Employees must not impose any construction loads on the partially completed structures unless such loading has been considered in the design, has been determined to be safe and capable of supporting the load by a PE, and is shown on the formwork design drawings or specifications.
- Drawings and Plans. A PE must approve and sign detailed design calculations and working drawings for all formwork or vertical shoring installations when any of the following conditions exist:

    - the height, as measured from the top of the sills to the soffit of the superstructure, exceeds 14 feet,
    - individual horizon span lengths exceed 16 feet, and/or
    - provisions are made for vehicular or railroad traffic through the falsework or vertical shoring.
    - For all formwork and vertical shoring installations not discussed above, one of the following must approve and sign the formwork plan or shoring layout:
    - PE,
    - manufacturer’s authorized representative, or
    - contractor’s representative qualified in using and erecting formwork and vertical shoring.
    - A PE must make drawings or plans showing the jack layout, formwork, shoring, working decks, and scaffolding available at the jobsite.

- Form Anchors. A PE must design form anchors, which support forms and scaffolding, with a minimum safety factor of three. Employees must not impose load on form anchors or concrete anchorages until the concrete has set the minimum period set forth in paragraph 4.04.8.h, Releasing and Moving Forms of this section. Form sections supported by form anchors must be no more than 50 feet long and employees must design and install the form anchors so no forces, incurred by form or anchorage failure, can transfer to an adjacent section.
- Housekeeping. In all areas where persons must work or pass, employees must promptly remove and stockpile all stripped forms and shoring. Additionally, employees must pull or cut protruding nails, wire ties, and other unneeded accessories to avoid hazards.
- Fall Protection. Employees, when working 6 feet or more above any adjacent work surface (and not protected by fixed scaffolding, guardrails, or safety net), must use a personal fall protection system. Employees working in a stationary position may use a positioning system, but only until relocating.

f. Vertical Shoring

- Additional Loading. Employees must only temporarily store reinforcing rods, materials, or equipment on top of formwork if structures have been designed or strengthened to support the additional loading. Employees must not load eccentric loads on shore heads or similar members unless these members are designed for intended loading.
- Sills. Sills used in shoring must be sound, rigid, and able to carry the maximum intended load.
- Inspection. The first-line supervisor or project lead must conduct visual inspections of vertical work and shoring during erection, prior to use, and during use. The first-line supervisor must also ensure all equipment conforms to the shoring layout and there is no damaged equipment. The first-line supervisor or qualified personnel must immediately reinforce or reshore any damaged or weakened shoring equipment. Work shall stop if the inspection indicates critical failure potential or unmitigated hazards. Work shall resume when the first-line supervisor or project lead has addressed the issue and the hazard is abated.
- Reshoring. Employees must provide reshoring when necessary to safely support slabs and beams after stripping or where such structures are subject to superimposed loads.
- Removal of Shoring. Employees must only remove shoring equipment after the concrete has reached the minimum strength required in the formwork and shoring design and a PE or supervisor has inspected and approved the placement. First-line supervisors or PEs must plan removal so as not overload in-place shoring equipment.

g. Vertical Slip Forms

A PE experienced in slip-form design must design any vertical slip forms. The first-line supervisor must make a copy of the designs available on the jobsite. The first-line supervisor

must have experience with vertical slip forms and shall oversee all vertical slip form operations. The first-line supervisor must be present on the deck during slipping.

- Jack Supports. A PE must design any steel rods or pipes on which the jacks climb (or by which forms are lifted) for that purpose. Employees must encase supports in concrete or anchor the supports to the ground. Supports anchored or secured by form anchors must use two or more independent form anchors, separated by a minimum of 5 vertical feet.
- Vertical Loading. Employees must position jacks and vertical supports to equally distribute vertical loads. Loads must not exceed the capacity of the jacks.
- Line and Plumb. Employees must keep the form structure in line and plumb during jacking operations.
- Lifting. Employees must not exceed the predetermined safe rate of lift.
- Bracing. Employees must provide lateral and diagonal form bracing to prevent excessive distortion of the structure during jacking.
- Holding Devices. The job site must provide jacks or other lifting devices with mechanical dogs and other automatic holding devices for protection in case the power supply or lifting mechanism fails.
- Scaffolding and Platforms. Vertical lift forms must have scaffolding or work platforms which completely encircle the area of placement.

h. Releasing and Moving Forms

Any form raising or moving by crane, cableway, A-frame, or other mechanical lifting device, requires a lift plan. Personnel shall not ride forms or scaffolding during lifts. Personnel shall not be directly underneath any lifted forms.

- Lifting. When raising or moving forms by crane, cableway, A-frame, or similar mechanical lifting device, employees must securely attach the forms to wire rope slings with a minimum safety factor of 8. Employees must equip the panels and form sections with hoisting brackets to attach slings and must remove loose tools and materials before moving forms. Employees must use taglines for controlling forms whenever necessary to protect personnel or structures.
- Releasing. Employees must adequately brace or secure vertical and overhead forms before releasing them. Before releasing and moving forms, the first-line supervisor must relocate any employees at risk to falling materials.
- Form Removal. Employees must not remove forms, shoring, or bracing until the first-line supervisor or the job lead have determined the concrete is sufficiently strong to support its weight with all loads placed on it.

i. Precast Concrete

Employees must brace precast concrete walls, structural framing, or tilt-up wall panels until after making permanent connections.

- Temporary Bracing. A PE must design temporary bracing for precast concrete walls, structural framing, or tilt-up wall panels. Such bracing must provide at least 15 psf on projected surfaces.
- Suspended Loads. First-line supervisors must not allow employees under precast concrete members as lifted or tilted into position.
- Lifting Inserts. The lifting inserts for tilt-up concrete members must be able to support at least two times the maximum intended load. Other types of lifting inserts for precast concrete members must be able to support at least four times the maximum intended load. Lifting hardware must be able to support at least five times the maximum intended load.

j. Lift-Slab Operations

A PE experienced in lift-slab construction shall design and plan all lift-slab operations. Such plans shall include detailed instructions and design drawings which prescribe the method of erection and ensure lateral stability of the structure.

- Jacks/Lifting Units. Employees must mark jacks/lifting units to show the rated capacity established by the manufacturer. Employees must not load jacks/lifting units beyond the rated capacity and must install a safety device for jacks/lifting units to ensure loads will remain supported in any position if jacks malfunction.
- Jacking Operations. Operators must synchronize jacking operations so the slab will remain level at all support points to within a 0.5-inch tolerance. If leveling is automatically controlled, job sites must install a device which will stop the operation when tolerance is exceeded or when the jacking system malfunctions. If manual controls maintain leveling, the operator must locate these controls in a central location. An experienced, competent person must attend the controls during lifting. First-line supervisors must limit the maximum number of manually controlled jacks/lifting units on one slab so the operator can maintain the slab level. The maximum number must not exceed fourteen jacks/lifting units. During jacking operations, only essential employees may remain in the building/structure.

    - Wedges. When making temporary connections to support slabs, employees must secure wedges with tack welding, or an equivalent method, to prevent them from falling out of position. Employees will only release lifting rods after securing column wedges.
    - Welding. A certified welder must perform all welding on temporary and permanent connections. Employees must not execute load transfer from jack/lifting units to building columns until the welds on the column shear plates cool to air temperature.
    - Secure Installation. Employees must secure jacks/lifting units to building columns so to not dislodge or dislocate. The PE must design, and employees must install, equipment so the lifting rods cannot slip out of position.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 4.05 Steel Erection

1. Scope

This section establishes steel erection requirements for all Bureau of Reclamation (Reclamation) owned and operated facilities and construction sites. Where this section does not provide specific definitions or instructions, it adopts, by reference, the current editions of the Federal Occupational Safety and Health Administration (OSHA) regulations.

2. General Requirements

a. Planning

All operators must conduct steel erection following the requirements of this section and 29 CFR 1926 Subpart R, Steel Erection. American Society of Safety Professionals (ASSP)/American National Standards Institute (ANSI) A10.13, Safety Requirements for Steel Erection, shall be used as a guideline for steel erection operations.

b. Steel Erection Start

Steel erection operations shall not start until the project manager and, as needed, the contracting officer's representative have verified the steel erector received written notification of concrete/masonry cure and anchor bolt status as required by 29 CFR 1926.752, Site Layout, Site-Specific Erection Plan and Construction Sequence.

c. Fall Protection

All operators shall follow Reclamation Safety and Health Standard (RSHS) Section 1.14, Fall Protection, during steel erection operations, except where specific requirements are provided by this section and 29 CFR 1926.760, Fall Protection.

d. Hoisting and Rigging

All operators shall follow RSHS Section 3.02, Slings and Rigging Hardware, and RSHS Section 3.03, Appendix 3.03-B Hoists, during steel erection operations except where specific requirements are provided by this section and 29 CFR 1926.753, Hoisting and Rigging.

3. Responsibilities

a. Project Manager

- Shall provide written authorization for the commencement of steel erection operations after verifying compliance with all referenced applicable standards including written verification concrete and masonry cure and anchor bolt repairs.

b. Contracting Officer's Representative (COR)

- Shall provide the project manager's written authorization to the contractor for the commencement of steel erection operations after receiving written verification for concrete and masonry cure and anchor bolt repairs.
- Shall verify contractor's personnel involved in steel erection operations receive training as required by this section.

c. Construction Inspector

- Shall inspect steel erection materials for damage during transportation, handling, and storage.

d. First-Line Supervisors

- Shall ensure employees involved in steel erection operations receive training as required by this section.
- Shall suspend steel erection operations if hazardous environmental conditions (e.g., weather) cause an unsafe work environment.

e. Qualified Person

- Shall develop and revise the site-specific steel erection plan.
- Shall provide steel erection training required by this section.

f. People Doing the Work

- Shall complete training required by this section.

4. Training Requirements

Training shall meet the requirements of 29 CFR 1926.761, Training. Qualified person(s) with knowledge, training, and experience in steel erection procedures and operations shall provide all training related to steel erection.

a. Initial

- Fall Hazards. Steel erection personnel exposed to fall hazards shall complete training in the following areas:

    - recognition and identification of fall hazards,
    - use and operation of guardrail systems, perimeter safety cable systems, personal fall arrest systems, positioning device systems, fall restraint systems, safety net systems, and other fall protection systems,
    - procedures for erecting, maintaining, disassembling, and inspecting fall protection systems,
    - procedures to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls, and

  - fall protection requirements of this section, Section 1.14, and 29 CFR 1926 Subpart R, and 29 CFR 1926.760.

- Multiple Lift Rigging. Steel erection personnel involved in multiple lift rigging shall complete training in the following areas:

  - hazards associated with multiple lift operations, and
  - procedures and equipment required by this section, Section 3.02, and 29 CFR 1926.753.

- Connectors. Steel erection personnel involved in connector operations shall complete training in the following areas:

  - hazards associated with steel erection connecting operations, and
  - techniques and work practices for establishing, accessing, and conducting connecting operations meeting the requirements of this section and 29 CFR 1926.756, Beams and Columns, and fall protection requirements of this section, Section 1.14, and 29 CFR 1926.760.

- Controlled Decking Zone. Steel erection personnel involved in controlled decking zone operations shall complete training in the following areas:

  - hazards associated with steel erection work within a controlled decking zone, and
  - techniques and work practices for establishing, accessing, and conducting controlled decking zone operations meeting the requirements of this section and 29 CFR 1926.754, Structural Steel Assembly, and fall protection requirements of this section, Section 16, and 29 CFR 1926.760.

b. Refresher

Steel erection personnel who have not conducted steel erection operations 2 years prior to start of work shall complete the initial training outlined in 4.05.4.a.

c. Recordkeeping

The Department of the Interior shall keep and manage Reclamation's training records in the official repository in accordance with the Information Management Handbook.

5. Hazard Identification, Assessment, and Safety Measures

a. Job Hazard Analysis (JHA)

The first-line supervisor shall complete a JHA for all steel erection operations. As needed, the JHA and exposure assessment shall be part of the site-specific erection plan.

b. Material Inspection

Qualified personnel shall inspect steel erection materials prior to installation for damage during transportation, handling, and storage.

6. Pre-job Briefing and Planning Requirements

a. Hoisting Planning

The steel erector shall develop a site-specific hoisting plan which outlines hoist selection, site preparation, hoist placement, equipment inspections, hoisting of personnel, working under loads, and multiple lift rigging procedures.

b. Steel Erection Planning

The steel erector shall conduct steel erection operations following the methods, steps, and requirements as outlined in 29 CFR 1926 Subpart R or develop a site-specific erection plan. A qualified person shall develop the site-specific erection plan and make the plan available at the work site. The first-line supervisor and staff as appropriate will hold preconstruction conferences and site visits to develop and review the site-specific erection plan. The site- specific erection plan shall include:

- a sequence of erection activity detailing delivery, staging, and storage of material and coordination with other construction activities,
- a site-specific hoisting plan which describes the crane and derrick selection and placement procedures detailing site preparation, path for overhead loads, rigging supplies/equipment, and critical lifts,
- a description of steel erection activities and procedures, including stability considerations requiring temporary bracing and guying, erection bridging terminus point, anchor rod (anchor bolt) notifications regarding repair, replacement and modifications, columns and beams (including joists and purlins), connections, decking, and ornamental and miscellaneous iron,
- the requirements for personal protective equipment (PPE) at the site,
- a description of the fall protection procedures used to comply with this section and 29 CFR 1926.760,
- a description of the procedures used to prevent and provide protection from falling objects to comply with 29 CFR 1926.759, Falling Object Protection,
- a description of the special procedures required for hazardous tasks not routinely conducted during steel erection projects,
- verification each employee completed training for performing steel erection operations required by 29 CFR 1926.761, Training, (e.g., fall hazard prevention and protection procedures, multiple lift rigging procedures, connector procedures, and controlled decking zone procedures),
- a list of qualified and competent persons,

- a description of procedures used in the event of rescue or emergency response,
- identification of the site and project, and
- the date(s) and signature(s) of the qualified person(s) responsible for the plan's preparation and modification.

7. Hazardous Environmental Conditions (Weather/Other)

The first-line supervisor shall suspend steel erection operations if the hazards from wind, rain, lightning, hail, ice, heat exposure, or air quality cause an unsafe work environment.

8. PPE

The first-line supervisor or other qualified person shall select PPE according to requirements of the job and document the selected PPE in the JHA and, as required, the site-specific erection plan. PPE must meet the requirements of RSHS Section 1.07, Personal Protective Equipment.

9. Safe Practices

a. Concrete and Masonry Cure

Steel erection shall not start until written verification that concrete in the footings, piers, and walls, and mortar in the masonry piers and walls, has attained either 75 percent of the intended minimum compressive design strength or sufficient strength to support loads imposed during steel erection (based on requirements of the American Society for Testing and Materials International standard test method of field-cured samples).

b. Anchor Rod Repairs

Steel erection shall not start until written verification that qualified personnel complete any anchor rod (anchor bolt) repairs, replacements, or field modifications with the approval of the project structural engineer of record and receipt by the COR.

c. Site Layout

- Control. The steel erection site shall have established safe areas and methods to control the access of people and vehicles.
- Access Roads. The steel erection site shall have access roads into and through the worksite for the safe delivery and movement of derricks, cranes, trucks, materials, and other necessary equipment.
- Storage and Work Area. The steel erection site shall have a firm, graded, and drained area for storage of equipment and materials and for operation of equipment.

d. Hoisting

Operators shall inspect cranes used for steel erection operations prior to each shift. First-line supervisors or other qualified persons shall pre-plan all routes for suspended loads to ensure no

employee works directly below a suspended load, except employees engaged in the initial connection and/or employees necessary for hooking or unhooking the steel. A qualified rigger trained to use hooks with self-closing safety latches, or equivalent, to prevent unintentional displacement, shall rig all hoisted materials.

e. Fall Protection

- Program. All fall protection programs must include each phase of steel erection and detailed steps to protect, prevent, and eliminate, to the extent possible, an employee's exposure to falls.
- Walking and Working Surfaces. Job sites must provide guardrail systems, safety net systems, personal fall arrest systems, positioning device systems, or fall restraint systems on walking/working surfaces with an unprotected side or edge more than 15 feet above a lower level to protect personnel from fall hazards.
- Connectors. Job sites must provide guardrail systems, safety net systems, personal fall arrest systems, positioning device systems, or fall restraint systems on walking/working surfaces with an unprotected side or edge more than two stories, or 30 feet, above a lower level to protect connector operation personnel from fall hazards. At heights over 15 and up to 30 feet above a lower level, connector operation personnel shall use a personal fall arrest system, positioning device system, or fall restraint system and wear equipment necessary to tie-off; or first-line supervisors must provide personnel with other means of protection from fall hazards in accordance with 1.11. Walking and Working Surfaces.
- Controlled Decking Zone. Job sites must provide personal fall arrest systems, positioning devices systems, or fall restraint systems at the controlled deck zone leading edge more than two stories, or 30 feet, above a lower level to protect personnel from fall hazards.
- Multi-Story Structures. After completion of metal decking, personnel must install safety cables to provide fall protection at the final interior and exterior perimeters of each floor.
- Steel Joist Restriction. Personnel shall not use steel joists and steel joist girders as fall arrest system anchorage points unless a qualified person provides written direction.
- Metal Decking Openings. The steel erector personnel shall install continuous decking, protection, and coverings for all openings in the metal decking per the requirements of 29 CFR 1926.754.

f. Permanent Flooring

- Installation. Personnel shall install permanent floors as steel erection progresses. Personnel must not install more than eight stories between the erection and uppermost permanent floors, except where the design maintains structural integrity.
- Bolting and Welding. Personnel shall erect no more than four floors, or 48 feet, of unfinished bolting or welding floors above the foundation or uppermost permanently secured floor, except where the design maintains structural integrity.

g. Temporary Flooring

- Installation. Personnel must maintain a fully planked, decked floor or safety nets within two stories, or 30 feet, directly under any steel erection work.
- Planking. Planking or decking shall support the minimum working load of 50 pounds per square foot. Wood planking shall be a minimum of 2-inches thick, full dimension, undressed, solid lumber, or equivalent material (e.g., laminated boards). Personnel shall install planking flush and secure to prevent movement.
- Safety Nets. Personnel must install safety nets when the distance above lower levels exceed two stories or 30 feet. The safety nets must clear the surface of structures below. Job sites must use safety nets manufactured in accordance with ASSP/ANSI A10.11, Safety Requirements for Personnel Nets.

h. Structural Steel Erections

The hoisting, placing, connecting, and bracing of structural steel components shall follow methods, steps, and requirements outlined in 29 CFR 1926 Subpart R or the site-specific erection plan.

i. Bolting

- Drift Pins. Employees knocking out bolts and drift pins must prevent materials from falling to lower levels.
- Impact Wrenches. Impact wrenches shall have a locking device for retaining the socket.
- Containers. When aloft, personnel must secure containers for storing and carrying bolts, drift pins, and rivets against accidental displacement.
- Drilling and Reaming. A team of two shall operate drilling and reaming machines unless the handle is firmly secured to resist the torque reaction should the reaming or drilling bit bind.

j. Fire Protection

- Fire Protection. The project manager must follow the requirements of RSHS Section 1.09, Fire Prevention and Protection, to develop a fire prevention plan, fire emergency action plan, and fire response plan for steel erection projects.
- Welding and Cutting. All personnel must follow the requirements of Section 1.09 and RSHS Section 1.15, Hand Tools, Power Tools, Pressure Vessels, Compressors, and Welding, to prevent sparks or fires.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 4.06 Reclamation Drilling Standards

1. Scope

This section establishes specific safety requirements for earth and rock drilling operations for all Bureau of Reclamation (Reclamation) owned, controlled, or occupied facilities and construction sites. This section does not apply to drilling holes for blasting operations. Reclamation Safety and Health Standard (RSHS) Section 4.03, Blasting Operations, provides drilling requirements for blasting operations.

2. Responsibilities

a. First-Line Supervisors

- Shall ensure employees assigned to drill teams receive training required by this section.

b. Onsite Job Leads

- Shall ensure employees conduct all site preparations and drilling operations as outlined by the drill plan and this section.
- Shall ensure employees cease all drill operations when weather conditions, as outlined in this section, present an unsafe work environment.

c. Regional Geologists and Drill Project Leads

- Shall develop a drill plan for all assigned drill projects.

d. Employees

- Shall complete training required by this section.
- Shall conduct all site preparations and drilling operations as outlined by the drill plan and this section.

3. Training Requirements

All drill team members shall complete one-on-one, on-the-job training from an experienced drill team member and shall demonstrate competence to an experienced drill team member before working independently in an assigned role.

4. Pre-job Briefing and Planning Requirements

a. Drill Plan

The regional geologists or drill project leads shall develop a drill plan including the following information:

- overview of the drilling project,

- site survey,
- site preparations,
- site layout and operations,
- job hazard analysis for each operation,
- emergency response plans,
- fire prevention and protection plans,
- required drilling equipment,
- required drill team members, and
- site closeout and remediation.

5. Hazardous Environmental Conditions (Weather/Other)

a. Lightning

The on-site job lead shall stop all drilling operations when lightning is detected within 5 miles of the drill site.

b. Wind

The on-site job lead shall stop all drilling operations when the wind speed at the drill site exceeds the manufacturer's recommendations or presents an unsafe work environment.

6. Personal Protective Equipment (PPE)

While at the drill site, first-line supervisors and/or onsite job leads shall provide all drill team members and visitors personal protective equipment for protection from potential hazards. This may include wearing safety glasses, hard hats, hard toe safety shoes, long pants, shirts with minimum 4-inch sleeves, hearing protection, and gloves meeting the requirements of RSHS Section 1.07, Personal Protective Equipment. The job hazard analysis shall identify required personal protective equipment.

7. Safe Practices

a. Site Survey

- Access Routes. The site survey shall identify existing or planned routes that allow for the safe and reliable access of equipment and personnel.
- Terrain. The site survey shall propose a work site that provides or that employees may modify to provide a safe location for equipment and personnel.
- Underground Utilities. The site survey shall identify underground utilities at the proposed work site.
- Aboveground Utilities. The site survey shall identify aboveground utilities at the proposed work site.

b. Site Preparation

- Underground Utilities. Onsite job leads shall ensure the applicable locating company locates and marks underground utilities prior to the start of on-site work.
- Aboveground Utilities. Employees must locate aboveground utilities and mark approach boundaries, as necessary, prior to the start of on-site work.
- Clearing. Employees must clear the work site to provide a safe location for equipment, supplies, and personnel.
- Protecting. Employees must configure the work site to protect it from collected water, flooding, ground caving, dirt slides, falling rocks, vegetation fires, falling trees, and other recognized hazards.
- Drainage. Employees must configure the work site with drainage and mud pits to safely direct and collect drill operation water and mud.
- Excavations. All excavation operations shall meet the requirements of RSHS Section 4.01, Excavation Operations.

c. Working Platforms

- General. The work platform shall meet the requirements of RSHS 1.11, Walking and Working Surfaces.
- Stabilize. Employees must site and construct drill platforms on stable soil and on supported foundations, timbering, or outriggers as needed.
- Lighting. The drill platform manufacturer must equip drill platforms used during nighttime hours or in areas without natural light with a lighting system that provides all working surfaces with a minimum of 10 lumens (i.e., foot candles) illumination.
- Electrical. The drill platform manufacturer must equip drill platforms, where required, with electrical systems installed and maintained per the requirements of National Fire Protection Association (NFPA) 70, National Electrical Code.

d. Drill Rigs

- Operator. Only authorized personnel trained in the operation of the specific drill rig may operate that drill rig.
- Operator-in-Training. Employees completing on-the-job training must operate equipment under the direct supervision of an experienced drill team member. An experienced drill rig operator must continuously monitor employees that are training to operate the drill rig.
- Emergency Stop System. The drill platform manufacturer must equip the drill rig with an emergency stop power shutoff safety system arranged so both the rig operator and the drill or auger head operator can activate the system from their workstation.
- Emergency Stop Labels. The drill platform manufacturer must label the emergency stop power shutoff safety system and employees must ensure the system is identifiable in all operating conditions indicating the function and method of operation.

- Emergency Stop Testing. Employees must function-test the emergency stop power shutoff safety system at the start of each shift.
- Warning Signs. Employees or the on-site job lead must equip the drill rig with warning signs containing the following wording in full view of the operators:

    - All personnel must be clear before starting machine.
    - Stop the auger prior to cleaning.
    - Stop engine when repairing, lubricating, or refueling.
    - Do not wear loose fitting clothing, jewelry, or extended cuff gloves.
    - Unattended Drill Hole. Employees must adequately cover and protect unattended drill holes to prevent people, animals, or debris from entering.

- Inspection. Employees must inspect the drill rig for the manufacturer's recommended safe operating conditions at the start of each shift.
- Control Levers. The drill platform manufacturer must design control levers, where practicable, to return to neutral when releasing the control levers.
- Control Lever Labels. The drill platform manufacturer must clearly label the control levers indicating the function and direction of operation.
- Refueling. Employees must only conduct refueling when the drill rig and internal combustion engines are shut down.
- Hoisting Equipment. The drill rig hoisting equipment shall meet the requirements of RSHS Section 3.03, Permanently Installed (Fixed) Cranes.
- Machine Guarding. The drill rig shall be equipped with machine guarding for all gears, moving parts, and power tools as required by RSHS Section 1.15, Hand Tools, Power Tools, Pressure Vessels, Compressors, and Welding and 29 Code of Federal Regulations (CFR) 1910 Subpart O, Machinery and Machine Guarding.
- Exhaust Systems. The drill platform manufacturer must equip the drill rig with spark arresters on all internal combustion engine exhaust systems.

e. Truck-Mounted Drills

- Work Platform. The truck-mounted drill work platform shall meet the requirements of RSHS Section 1.11.
- Vehicle Operations. The truck-mounted drill vehicle operations shall follow all the requirements of RSHS Section 1.21, Motor Vehicle Safety.
- Securing Equipment. Employees must secure the truck-mounted drill equipment and supplies in the transport position prior to moving the truck.
- Backing Alarm. The truck manufacturer must equip the truck-mounted drill
- vehicle with an automatic backup alarm.
- Truck Backing. The truck-mounted drill vehicle operator must inspect the area behind the truck for hazards, objects, and personnel before moving the truck backwards.

- Backing Spotter. The truck-mounted drill vehicle operator must use a spotter when moving the truck backwards.

f. Skid-Mounted Drill Units

- Towing. Employees will select and operate machinery used to tow skid-mounted drill units per the requirements of RSHS Section 3.05, Mobile and Stationary Mechanized Equipment.
- Hoisting. Employees will select and operate the hoisting equipment used to move skid-mounted drill units per the requirements of RSHS Section 3.03.
- Platforms and Access. The skid-mounted drill unit manufacturer must equip the drill unit with work platforms and personal access methods meeting the requirements of RSHS Section 1.11.
- Securing/Anchors. Employees must secure the skid-mounted drill unit in-place as required by manufacturer's operating instructions and recommendations.

g. Underground Drilling Operations

Underground drilling operations shall meet the requirements of RSHS Section 4.02, Tunnel and Shaft Construction, and 29 CFR 1926, Subpart S, Underground Construction, Caissons, Cofferdams, and Compressed Air.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 4.07 Diving Operations

1. Scope

This section establishes requirements for Bureau of Reclamation and contractor diving operations.

2. General Requirements

a. Reclamation Diving Operations

Reclamation divers shall meet requirements in the Diving Safe Practices Manual (DSPM) located on the Reclamation Intranet, Reclamation Safety and Health Standards (RSHS). The DSPM shall be the baseline diving policy and referred to for all Reclamation diving activities to ensure employee safety and regulatory compliance for underwater inspection and maintenance programs. Additional instructions shall be prepared for any operations extending beyond the scope of the DSPM and maintained by the dive team performing dive operations. The instructions shall be submitted for approval by the Regional Diving Advisory Committee (RDAC) and the Reclamation Diving Safety Advisory Board (RDSAB) prior to implementation.

b. Diving Safe Practices Manual

Reclamation's DSPM procedures and requirements shall comply with Occupational Safety and Health Administration (OSHA) 29 CFR 1910, Subpart T, Commercial Diving Operations, the U.S. Coast Guard 46 CFR 197, Subpart B, Department of the Interior (DOI) Manual, DM 485, Chapter 27, Underwater Diving Safety, and applicable U.S. Navy standards. A copy of the DSPM shall be available at every Reclamation dive site and all divers shall have access to this manual.

3. Responsibilities

a. Regional Directors

- Shall ensure compliance with all applicable dive safety regulations and requirements within each region.
- Shall appoint a RDAC if their region has a diving program. The regional director shall comprise the majority of the RDAC with divers who shall implement the DSPM at the regional level to assure an efficient and safe underwater examination and inspection program. The RDAC shall have at least five members and shall include the regional safety manager and the regional dive team leader.

b. Area Office Managers

- Shall ensure the applicable staff perform diving operations in their responsible locations according the DSPM.

c. First-Line Supervisors

- Shall approve employees to participate on the dive team and ensure employees complete the required training outlined in the DSPM Section 4.1, Training and Experience, and complete medical examinations in DSPM Section 5.2, Dive Medical Surveillance, if they are a member of the dive team.

d. Regional Safety Managers

- Shall support the RDSAB for diving activities in their region.
- Shall be part of the RDAC if their region has a diving program.

e. Reclamation Contracting Officer's Representatives (COR)

- Shall approve the contractor's Safe Practices Manual, diving plan, and dive hazard analysis in coordination with the RDSAB.
- Shall record divers' names, qualifications, and ensure divers are at least 18 years old prior to initiating diving operations.

f. Reclamation Regional Dive Team Leaders

- Shall be a senior dive team member with the experience and training necessary to conduct diving operations safely according to this section and regulatory requirements.
- Shall have the experience and formal training in dive planning, diving procedures, CPR, first aid, etc., to conduct assigned diving operations.
- Shall have experience in conducting underwater inspections of Reclamation structures and adequate expertise to manage dive operations.
- Shall have a working knowledge of this RSHS section, any additional DSPM responsibilities identified in DSPM Section 3.1, Regional Dive Team Leader, and Reclamation management policies.
- Shall maintain training records for all dive related training courses outlined in DSPM Section 4.2, Documentation of Diver Training and Qualifications.
- Shall ensure their employees complete the required training outlined in the DSPM Section 4.1, and complete medical examinations in DSPM Section 5.2 if they are a member of the dive team.

g. Reclamation Dive Supervisors

- Shall be an experienced diver trained extensively in dive operations, dive planning, diving emergency procedures, and dive safety.
- Shall have completed training to the journeyman diver level and shall be responsible for specific diving activities as assigned by the regional dive team leader.
- Shall have a working knowledge of this RSHS section and any additional DSPM responsibilities identified in DSPM Section 3.2, Dive Supervisor.

h. Reclamation Journeyman Divers

- Shall meet the qualifications and experience outlined in the DSPM Section 3.3, Journeyman Diver.

i. Reclamation Divers

- Shall be at least 21 years of age and complete the required training outlined in DSPM Section 4.1.
- Shall complete medical examinations performed by a licensed physician with experience in diving medicine as outlined in the DSPM Section 5.2.
- Shall have a working knowledge of this section, any additional DSPM responsibilities identified in DSPM Section 3.4, Diver, and Reclamation management policies.

j. Human Resources Officers

- Shall maintain any medical examination results, clearance documentation in the employee's medical folder according to 29 CFR 1910.1020(d)(1), Access to Employee Exposure and Medical Records, and the Privacy Act of 1974 (P.L. 93-579), and provide the regional dive team leader with the clearance results as requested.

4. Contractor Diving Operations

a. General Requirements

Conventional hardhat and lightweight surface-supplied, and self-contained underwater breathing apparatus (SCUBA) diving operations must conform to Federal 29 CFR 1910, Subpart T, Commercial Diving Operations. Contractors shall provide an onsite dive supervisor overseeing dive operations, employees, and decompression procedures.

b. Diver Qualifications

Contracted divers shall be at least 18 years old and have the training and experience outlined in 29 CFR 1910.410, Qualifications of a Dive Team, to perform assigned tasks in a safe manner. Divers must have a certificate of training from a recognized diving school or certified record of past diving experience and documentation that they have been cleared for diving by a physician, preferably by a hyperbaric physician, or other licensed physician knowledgeable in the physiology of diving within the past year.

c. Safe Practices Manual

The COR must review the contractor's Safe Practices Manual, dive plan, and dive hazard analysis to ensure they meet Reclamation requirements prior to bringing any equipment to the dive site. The Safe Practices Manual must be available to all divers at each dive location and meet the requirements in 29 CFR 1910.420, Safe Practices Manual.

d. Pre- and Post-Dive Procedures

Contractor procedures shall meet the requirements in 29 CFR 1910.421, Pre-Dive Procedures; 29 CFR 1910.422, Procedures During Dive; and 29 CFR 1910.423, Post-Dive Procedures to implement safe diving procedures.

e. SCUBA Diving

Contractors shall meet the SCUBA diving limits requirements and procedures in 29 CFR 1910.424, SCUBA Diving.

f. Surface-Supplied Air Diving

Contractors shall meet the surface-supplied air diving limits requirements and procedures in 29 CFR 1910.425, Surface-Supplied Air Diving.

g. Contractor Diving Equipment

Contractors shall meet the following equipment procedures and any additional requirements in 29 CFR 1910.430, Equipment:

- equipment modification, repair, test, calibration, or maintenance service,
- air compressor system,
- breathing gas supply hoses,
- buoyancy control,
- compressed gas cylinders,
- decompression chambers,
- gauges and timekeeping devices,
- masks and helmets,
- oxygen safety, and
- weights and harnesses.

5. Reclamation Diver Training

a. Training and Experience

Reclamation divers engaged in SCUBA diving or surface-supply diving must have experience and training as outlined in DSPM Section 4.1, Training and Experience.

b. Diver Proficiency

Each diver must make 12 dives annually in the modes of diving for which they are qualified, with at least 1 dive every 6 months. Each diver shall perform at least 1 under the supervision of the regional dive team leader or their representative every 12 months and meet any additional requirements outlined in DSPM 4.3, Maintaining Eligibility as a Reclamation Diver.

6. Reclamation Recordkeeping

All training records shall be kept in the Department of the Interior's approved repository and managed in accordance with the Information Management Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01). Regional Dive Team Leaders will also keep training records for each qualified regional dive team member as outlined in DSPM Section 4.2, Documentation of Diver Training and Qualifications.

7. Reclamation Dive Planning

a. Dive Hazard Analysis (DHA)

Dive supervisors must prepare the DHA for approval by the regional dive team leader, RDAC regional safety and occupational health manager, and one other RDAC member. DSPM Section 6.1, Dive Hazard Analysis addresses the minimum required plan elements.

b. Job Hazard Analysis (JHA)

The responsible facility representative must develop a JHA when diving around structures where local facility support personnel are operating cranes, man-skips, motorized equipment, vessels, etc., or when non-divers are involved in the diving activity. Reclamation requires a JHA in addition to a DHA.

c. Dive Planning

The dive supervisor must complete a dive plan as part of the DHA. The dive plan must include goals, desired results, and diving tasks required to achieve the objective. The regional dive team leader, RDAC regional safety and occupational health manager, and one other RDAC member must approve the dive plan. DSPM Section 6.2, Dive Planning, addresses additional required elements for the DHA and dive plan.

8. Reclamation General Diving Requirements

DSPM Section 6.4, General Diving Requirements and Guidelines, covers the minimum procedures below to use during diving operations depending on the nature of the task:

- water entry and exit,
- confined space or ladder entry,
- communications,
- dive log, and
- air decompression policy.

9. Post-Dive Requirements and Guidelines

a. Physical Condition Check

The dive supervisor will assess the physical condition of each diver checking for symptoms of decompression sickness, arterial gas embolism, trauma, environmental exposure, and general well-being.

b. Flying After Diving Rules

Ascent to altitude after diving increases the risk of decompression sickness. Reclamation follows DSPM Appendix H, Altitude Correction, US Navy Sea Level Equivalent Depth (fsw), regarding flying after diving. The waiting time required between the last dive and flying depends on the repetitive group of the diver after diving. DSPM Appendix H2 lists the surface interval allowed between the last dive and flying.

10. Open Circuit SCUBA Diving Modes I and II

Divers and dive supervisors must have a working knowledge of the equipment, equipment limitations, diving procedures, and any other tools that may apply to SCUBA operations. Prior to leaving the surface, supervisors must brief divers on maximum depth, times permitted on the bottom to remain within the no-decompression limits, and the required decompression obligations if divers exceed the planned bottom time. Refer to the DSPM Section 7, Open Circuit SCUBA Diving – Modes 1 and II, for additional requirements.

11. Surface-Supply Air Diving (Lightweight) Mode III

Air for surface supplied diving operations must meet the purity requirements outlined in DSPM Section 10, Diving Equipment Standards and Maintenance. Refer to the DSPM Section 8, Surface Supply Air Diving (Lightweight) Mode III, for additional requirements.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 4.08 Tower Climbing Safety

1. Scope

This section applies to all Reclamation employees, contract workers, contractors, and subcontractors that work on communication towers, antennas, and antenna supporting structures, where workers are exposed to potential falls at heights.

2. General Requirements

a. Designation of a Regional Program Coordinator

Each region must designate a regional program coordinator (RPC) for tower climbing activities. In addition, each area office shall designate a local program coordinator (PC), as appropriate, who will work with the RPC.

b. Medical and Work Qualifications

Occupational Safety and Health Administration (OSHA) standards 29 CFR 1910 and 29 CFR 1926 and Departmental Manual Part 485 (485 DM) require that employees and contractors who work on towers must be medically qualified to perform those jobs; be trained and certified as qualified to perform those jobs; have the appropriate equipment to do the job; climb only towers that are certified, have passed a formal inspection within the last 5 years, and have passed a pre-climb inspection; and perform those jobs in accordance with this section and the Code of Federal Regulations.

c. Tower Certification

Tower climbers must only climb towers certified by the manufacturer to meet the specifications of the Telecommunications Industry Association's TIA 222-H, Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures, for towers and 29 CFR 1926 Subpart M, Appendix C, Personal Fall Arrest Systems – Non-Mandatory Guidelines for Complying with 1926.502(d), for anchorages. Towers that do not meet these standards must be red tagged with the words Do Not Climb until the towers are retrofitted or replaced with towers that do meet these standards. Until then, work activities must be accomplished by other methods (e.g., aerial devices).

d. Tower/Structure Inspections

- Formal Inspections. The RPC and regional safety manager (RSM) must ensure that all communication structures owned by Reclamation and subject to climbing are formally inspected every 5 years.
- Pre-climb Inspections. Prior to work/climbing, an inspection and site evaluation must be completed. At a minimum, the inspection must include the following steps:

- determine the type and height of the tower, the location and types of antennas, and the tools and safety equipment required to perform the job,
- determine if access to the site requires notification to the owner (if not a Reclamation tower),
- review the last formal inspection,
- determine if the structure seems to be sound, if guyed wires are secure and in good condition, if ladders and bolts are secure, and if safety cables are installed and in good condition,
- check for signs of rust or degradation of the structure (for example, movement or degradation of the foundation slabs),
- determine the path to climb and whether any equipment needs to be turned off or reduced,
- check that the weather is adequate for climbing and if changes in the weather are expected during the climb,
- verify and document that all personal protective equipment (PPE) used for the climb is in good condition,
- ensure communication methods and expectations are in place and review them with the climbers and ground crew, and
- ensure that an emergency medical and rescue plan has been developed and review it with all participants.

e. Emergencies

Situations where an imminent threat to human life exists because of the lack of telecommunications services may require prompt performance of tower or elevated work. Every effort must be made to perform a hazard/risk assessment of the work in accordance with RSHS Section 1.04, Work Planning. At a minimum, a pre-climb inspection must be performed, and any emergency work performed that does not comply with this section must be clearly documented and reported to the RPC and the RSM prior to beginning work.

f. Stop Work Criteria

The employees climbing towers are the ones at risk and have the responsibility for determining whether to climb a tower or do elevated work based on their hazard assessment of the job task. If any involved employees feel an unsafe situation exists, they have the right to stop work and follow the stop work procedure in SAF P01, Appendix A, which is located on the “Policies” page of the Reclamation Manual website.

3. Responsibilities

a. Reclamation Safety and Occupational Health Office

- Shall provide safety assistance to tower climbing PCs and provide direction to regions on implementing the Department of the Interior Occupational Medicine Program Handbook.

b. Regional Director

- Shall appoint an RPC that has appropriate experience and has completed the required training outlined in paragraph 4.08.4 to ensure that the requirements contained in this section are met for all tower climbing and elevated work activities and that a tower climbing program is established in accordance with the requirements in this section.

c. Area Office Manager

- Shall ensure all affected employees and outside contractors are trained on and comply with this program.
- Shall provide necessary resources to implement and maintain the procedures in this section.
- Shall select a PC, as appropriate, that has been approved by the RPC and provide them with the authority to implement the procedures of this section.

d. Regional/Area Office Program Coordinators

- hall draft, monitor, periodically review the effectiveness of the region's tower climbing program and make revisions as necessary. This may include conducting inspections of tower climbing activities, reviewing equipment, reviewing contractors working on Reclamation's behalf, and conducting meetings with project managers to review tower climbing practices.
- Shall ensure that the proficiency requirements for employees performing climbing activities are met, that employees receive the proper training in the use/care/inspection of fall protection equipment, and that climbers are tested for knowledge, understanding, and competency for their region's tower climbing program.
- Shall maintain an inventory of qualified climbers and ensure that an annual inspection of PPE is completed.
- Shall participate in the development and implementation of a regional tower climbing program and generate an annual status report to the RSM.
- Shall, in coordination with safety staff and supervisors, conduct accident investigations to determine the root cause of any accident and prescribe corrective actions to prevent future accidents.
- Shall complete the required training outlined in paragraph 4.08.4 to ensure that the requirements contained in this section are met for all tower climbing activities and that a tower climbing program is established in accordance with the requirements in this section.

e. First-Line Supervisors

- Shall perform periodic assessments to ensure that employees performing tower climbing activities follow all program requirements and good safety practices.

- Shall ensure that employees performing tower climbing activities have current medical clearances and are provided with tower climbing and fall protection courses that meet the training requirements contained in this section.
- Shall maintain position descriptions that accurately relate to tower-climbing physical requirements and abilities.
- Shall be aware of, to the best of their ability, any health issues that would restrict an employee from tower climbing activities and shall notify the RPC and/or area office PC of such restrictions.
- Shall ensure that a job hazard analysis (JHA) is completed for all tower climbing activities and that work procedures are clearly defined and well understood by the work crew.

f. Onsite Job Leads

- Shall have completed formalized training documenting that they have the skills necessary to identify the type of fall protection system required for the climb, to ensure that fall protection equipment is inspected prior to each use, and to be able to identify safety issues during the climb.
- Shall ensure that a JHA is completed, that specific work procedures are clearly defined and well understood by the work crew, and that a minimum of two qualified climbers are required for each tower climbing activity.
- Shall evaluate, to the best of their ability, the physical condition of the climbers before allowing them to climb and shall notify the RPC if a climber is medically restricted to climb and again when medical restrictions have been lifted.
- Shall stop work when safety concerns are identified until the issue is resolved per SAF P01, Appendix A.
- Shall be aware of changes in conditions and events as the job progresses that may require review and modification of the fall protection system in use or the work procedure plan.

g. Tower Climbers

- Shall attend a working-at-heights qualified climber training course that covers tower climbing, fall protection, and rescue competent person and that results in certification as a qualified climber.
- Shall complete a physical every three years, as required in 485 DM.
- Shall ensure that, before climbing, they understand the hazards and the danger involved with climbing, use personal fall protection equipment, meet the requirements of a certified qualified climber, and participate in the development of a JHA so they understand the safety and health requirements and work procedures of the job.
- Shall always adhere to the 100 percent tie off requirement. No one is to ascend or descend a tower unless their hands are free.

- Shall regularly use and document the inspection of their PPE that includes fall protection equipment to ensure that it is in good working condition before each use and that it is in accordance with the manufacturer's recommendations.
- Shall assess the conditions or potential conditions that could impede a safe climb and then determine whether it is safe to climb. Conditions may include, but are not limited to, hazardous weather, insect or animal infestations, unavailable or damaged PPE, tower damage or insufficient tie off points, etc. Climbers must only climb in conditions that are determined to be safe and must inform their management if they believe that a climb presents an unusual risk to their safety and/or health so it can be mitigated.
- Shall inspect all PPE, including fall protection equipment, before each use to ensure that it is in good working condition, document the inspections, and ensure that PPE is used in accordance with the manufacturer's recommendations.
- Shall make the onsite job lead aware of any physical conditions that may impact their ability to perform the work safely.
- Shall not climb at a site without another qualified and competent person present.

h. Regional Safety Manager

- Shall assist in developing and establishing the tower climbing program. The RSM, in cooperation with the RPC, must perform periodic spot checks to ensure compliance with this program and provide guidance for the regional radio frequency (RF) safety program. The RSM, in coordination with the RPC or local PC, shall assist supervisors and/or climbers in arranging for training and for purchasing approved fall protection equipment.

i. Project Manager/Acquisitions

- Shall ensure than an evaluation of a contractor or subcontractor has been conducted to confirm that the contractor is competent and qualified for tower construction, maintenance, etc., prior to signing a contract and initiating any work with the contractor.

4. Training Requirements

The training and qualification of employees for tower climbing consists of a 40-hour Competent Tower Climber and Rescue course that is approved by the RPC that meets the training and qualification requirements under this section. Required training must include both classroom instruction and actual field demonstration of the topics discussed in the classroom. Upon successful completion of "Competent Tower Climber and Rescue" course training and the required medical clearance and additional training outlined in section 4.08.4.a.3, climbers shall be certified as qualified climbers. An industry qualified instructor must conduct all classroom instruction, field demonstration, and testing for Reclamation-sponsored courses. Climbers will be tested for knowledge, understanding, competency, and proficient demonstration of use and maintenance of each piece of equipment used for tower climbing activities in their region's tower climbing program by their regional or local PC.

a. Initial

- Minimum Requirements. At a minimum, climbers must be trained in the following:

  - the nature of fall hazards on towers,
  - fall protection requirements,
  - use and care of a full body harness, including inspection and storage,
  - proper anchoring and tie-off techniques and reduction in strength caused by certain tie-offs,
  - maximum allowed free-fall and total fall distance,
  - determination of elongation and deceleration,
  - safety climbing devices,
  - proper rigging techniques,
  - tower climbing,
  - transferring between equipment and structures,
  - recognizing and avoiding dangerous conditions while at the same time mastering the difficulties of climbing, resting, and positioning for work on various structures,
  - methods for identifying energized power lines, apparatus, and other auxiliary equipment on the tower,
  - requirements for working on and around a structure near energized power lines, and
  - recognizing emergencies and selecting and using the appropriate rescue techniques and equipment.

- Medical Exam Required Before Training. Prior to attending training, climbers must pass the medical standards examination outlined and described in the Occupational Medicine Program Handbook. This examination describes the physical requirements needed to fulfill the qualified climber classification. The completed examination must be retained in the employee's official medical folder. A clearance stating only that the employee has passed the medical requirements must be provided by the physician conducting the examination to the RPC and the local PC if one is designated. If a climber does not meet the medical qualification but does meet all other requirements, he or she can be recertified after completing the medical examination, at which time the RPC or local PC shall document the recertification by making an entry in the climber's climbing record.
- Other Required Training.

  - First Aid/CPR Training. Qualified climbers and ground personnel must be trained in first aid and CPR and have a valid certificate from the American Heart Association or American Red Cross. This certificate must be obtained prior to any Reclamation-sponsored climbing training. Reclamation must provide first aid and CPR training to meet this qualification.
  - Radio Frequency Energy Training. Qualified climbers that could potentially be exposed to radio frequency energy (RF/EME) hazards must be trained in the

potential hazards of RF/EME and how to contain exposure to within acceptable limits.

- Electrical Safety Training. Qualified climbers that could potentially be exposed to electrical hazards must be trained about the electrical hazards they could encounter when climbing and any other relevant electrical safety procedures. All climbers working on electrical installations must have the appropriate training requirements for electrical work.

b. Certification

Documentation must consist of a certificate indicating that the individual has successfully completed the course of instruction and has the skills required to be proficient in the tower climbing program requirements in this section. Demonstrated proficiency must be included in the documentation. The documentation must be retained in an agency system of tracking training, and a copy must be forwarded to the RPC and the local PC if one has been designated.

c. Refresher/Recertification

Recertification involves an annual review of the qualified climber's record by the RPC and/or the local PC if one has been designated to determine when the qualified climber last performed a climb, last attended a Reclamation-approved tower climbing class, last completed a medical qualification per the Occupational Medical Program Handbook, and last attended a first aid/CPR class. The qualified climber's record will be updated to verify that they are either proficient or deficient in any of these requirements, as outlined in paragraph 4.08.4.d.

d. Proficiency Qualification

Qualified climbers must maintain proficiency in climbing and must receive periodic training in first aid/CPR, safety equipment, and climbing procedures to ensure skills are continuously developed. A qualified climber is considered proficient if they have:

- climbed at least twice in the past year,
- met the recertification requirements in paragraph 4.08.4.c, and
- been to a Reclamation-sponsored tower climbing course within the past 3 years.

The RPC and/or local PC shall document recertification by making an entry in the worker's climbing record.

e. Lack of Proficiency

If a qualified climber does not meet the proficiency requirements in paragraph 4.08.4.d, then they must correct any deficiencies by completing the appropriate training as outlined in paragraph 4.08.4.a.

f. Recordkeeping

All climbing training certificates, recertification statements, and medical clearances pertaining to a climber must be maintained for the duration of the qualified climber's employment. Training records must be kept in the agency system of tracking training, and courtesy copies of training and medical clearances must be sent to the RPC. Upon request, Reclamation must give the Deputy Commissioner of Labor for Occupational Safety and Health (or designee) access to the following:

- Training Records. All material related to the employee's training and education record.
- Medical Records and Non-ionizing Radiation Exposure Records. All medical records, in accordance with 29 CFR 1910.1020(d)(1)(i), and any material related to each analysis using exposure or medical records, in accordance with 29 CFR 1910.1020(d)(1)(iii).
- Equipment Inspections and Testing Records. All material related to the modification, repair, testing, calibration, or maintenance service of all climbing equipment.

5. Hazard Identification, Assessment, and Safety Measures

a. Before Climbing

A hazard assessment must be conducted to identify, assess, and control employee exposure to hazards as required by RSHS Section 1.04 and any other applicable rules or regulations. The severity of identified hazards must be reviewed, and control measures must be implemented using the hierarchy of controls and include rescue procedures and equipment to be used in the event of an injury. Results of the hazard assessment must be documented in the JHA. The JHA must be reviewed and signed by the work crew and onsite job supervisor prior to climbing.

b. Emergency Medical and Rescue Plan

An emergency medical and rescue plan must be developed as part of the JHA, and appropriate changes or additions must be made after it has been reviewed with the work crew. The plan must ensure prompt rescue of qualified climbers or a means to self-rescue (e.g., providing controlled descent devices, radios, etc.). Rescue of fall victims must be included in all training and job planning. Aerial devices, cranes, lifelines, or other devices capable of lifting the climber must be readily available. A critical lift plan, outlined in RSHS Section 3.03 and 3.04, is required when hoisting from a tower. This includes hoisting with gin poles, lifting blocks, etc. Rigging and riggers must meet requirements contained in RSHS Section 3.02, Slings and Rigging Hardware. At a minimum, the plan shall include:

- a procedure to be used in the event of a medical emergency or tower rescue that includes the use and availability of a competent rescuer to ensure the safest rescue is planned and conducted;
- emergency phone numbers for the specific site and what type of communication equipment is available to notify emergency or medical response services; and

- notification procedures in case of serious injury or death to ensure that the proper authorities and Reclamation officials are notified.

6. Pre-job Briefing and Planning Requirements

Before any climbing takes place, a safety meeting must occur with all qualified climbers and ground support personnel and cover specific information about the tower, the climb, PPE, communication needs, and steps that need to be taken if working near power lines. In addition, a site safety briefing must be held at the beginning of each day, new job, or if there is a change in work procedure(s) to review the potential hazards involved in the work to be performed and the rescue methods available. These discussions help to ensure the availability of proper rescue equipment and quick rescue of the worker. Prior to beginning the job, local emergency response must be provided information about the location of tower and the activities to be completed in case emergency response is needed.

7. Hazardous Environmental Conditions (Weather/Other)

a. Weather Conditions

The weather must be safe and stable for the climb to occur. Never climb when lightning or thunder is known to be or expected in the area. Extreme caution must be used during rainy, icy, or other conditions that may significantly increase the risk of the climb and/or degrade the structure. Wind speed criteria must be documented in the JHA that outlines when it is safe and not safe to climb.

b. Night and Low-Visibility Climbing

Climbing during daylight is always preferred, but it may be necessary under some circumstances to climb at night or during a time of low visibility, such as in fog. The RPC/local PC must approve all night climbs. Extreme caution must be exercised during such climbs.

c. Lighting for Night and Low-Visibility Climbing

All qualified climbers must use flashlights or other lighting equipment attached to their safety helmet to identify them from the ground and to observe the climber's performance. Additional flashlights may be used as needed; however, these must be attached to the climber in a manner that will not restrict the climber's movement or safety. Other lighting equipment must be available and used on the ground to provide adequate lighting.

8. Personal Protective Equipment

At a minimum, employees working on or around towers must wear and use the following PPE:

- personal fall arrest system,
- energy absorbing lanyards and restraint lines,

- head protection - that meets ANSI/ISEA Z89.1 Type-2 requirements to provide both protection for overhead impact, such as falling tools, or lateral impact that could result in fall,
- protective footwear,
- rescue/retrieval kit,
- RF personal monitors (based on site specific hazards),
- hand protection (safety gloves),
- safety glasses or safety goggles,
- hearing protection,
- communication device (e.g., radio, phone, mobile phone),
- wet-weather gear (based on site specific hazards),
- personal portable light for night work (based on site specific hazards),
- pole strap (based on site specific hazards).

Refer to RSHS Section 1.14, Fall Protection, and Section 1.07, Personal Protective Equipment, for additional information.

9. Safe Practices

When tower climbing, always follow safe climbing practices and watch for any unsafe climbing practices by others at the job site. All unsafe climbing practices must be eliminated or corrected before accidents occur. The following minimum safe climbing practices are required while working on towers:

- climb while rested and not fatigued,
- do not climb through or past unprotected electrical conductors,
- perform a visual inspection of the tower and PPE before climbing,
- only attach to a tower that has an adequate anchorage point,
- maintain 100 percent tie-off,
- do not throw any material up or down while on the tower,
- always maintain three points of contact with the tower,
- do not hold or attach onto antenna lines, coax, conduits, etc., for support,
- do not climb while ill or under the influence of prescription medication that could impair your judgment or physical abilities,
- do not climb while under the influence of alcohol or drugs, and
- never climb without another qualified climber.

a. Non-ionizing Radiation

- Radio Frequency Standards. The RPC/PC in coordination with the RSM must ensure that employees performing work on communication towers are not exposed to RF electromagnetic fields beyond the Federal Communications Commission maximum

permissible exposure limits in 47 CFR 1.1310, Radiofrequency Radiation Exposure Limits, and 29 CFR 1910.97, Nonionizing Radiation.

- Radio Frequency Exposures. Employees must not enter areas where RF exposure levels are above the general population/uncontrolled maximum permissible exposures described in 49 CFR 1.1310 without exercising controls as described throughout this section.
- Radio Frequency Control. Before qualified climbers perform work in areas on a communication tower where RF exposure levels exceed the occupational/controlled maximum permissible exposure values stated in 47 CFR 1.1310, written control procedures must be included in the JHA for reduction, elimination, avoidance, or protection from such RF levels. These written control procedures must include strategies for minimizing the exposure, locking out the hazard, using engineering and administrative controls, and prohibiting access, as described in the following paragraphs.

    - Minimize the Exposure. Reduce the transmitter power to a level that ensures RF exposure levels in areas where employees are working do not exceed the occupational/controlled values stated in 47 CFR 1.1310 and ensure that the transmitter power level is not increased until all employees have ceased working in those areas. If this method is chosen, the transmitter power must be locked out and tagged out at the reduced level by a competent person in accordance with 29 CFR 1910.147 and Reclamation's Facilities Instructions, Standards, and Techniques (FIST) 1-1. Prior to removing lockout/tagout devices and restoring the original transmitter power level, all employees must be notified and the work area must be checked to ensure that all employees have been safely positioned and removed.
    - Lock Out the Hazard. If the transmitter power level in areas where employees are working cannot be reduced and maintained at a level that ensures RF exposure levels do not exceed values stated in 47 CFR 1.1310, the transmitter power must be locked out and tagged out by a competent person in accordance with 29 CFR 1910.147 and FIST 1-1. Prior to removing lockout/tagout devices and restoring the transmitter power level, all employees must be notified and the work area must be checked to ensure that all employees have been safely positioned and removed.
    - Use Engineering and Administrative Controls. If the transmitter power level cannot be reduced or eliminated, employees must be permitted to access areas where the RF exposure exceeds the values stated in 47 CFR 1.1310 by implementing engineering or administrative controls that comply with Federal Communications Commission regulations concerning such exposure, including limiting the duration of the exposure and utilizing monitoring equipment, RF protective clothing, and other related PPE.
    - Prohibit Access. If Reclamation cannot ensure that the above conditions are met, then employees must not be permitted to access areas where RF exposure levels exceed the values stated in 47 CFR 1.1310.

- Use of Controls. Before any qualified climber commences work on a communication tower, a competent person must assess potential RF hazards of areas that may be accessed by employees during their work and post temporary signage to indicate areas where the RF hazard exceeds the general population/uncontrolled maximum permissible exposure limits set forth in 47 CFR 1.1310. Temporary signage must remain in place as long as work is being performed and the hazard exists.
- Radio Frequency Safety Program. When employees are exposed to RF fields beyond the general population/uncontrolled maximum permissible exposure limits established in 47 CFR 1.1310, the employer must develop, implement, and maintain a written safety and health program with site-specific procedures and elements based on the electromagnetic radiation hazards present. Climbers must be trained in the use of a calibrated RF level monitoring device and must use it when working around or on a tower that may have active transmitters at or above 500 watts or where the status of transmitters is unknown.

b. Structure Requirements

- Ascending and Descending Structures. When safe climb devices are available and operational, they must be used to ascend and descend a communications structure. In situations where a safe climb device is not available or not operational, and climbing has been determined necessary, qualified climbers must be allowed to climb while maintaining 100 percent attachment (tie-off) to a suitable anchorage point.

    - Fixed Ladders. When provided, fixed ladders must be used for ascending and descending communications structures, except where work assignments or conditions dictate otherwise.
    - Portable Ladders. Portable straight or extension ladders must be placed at an angle that does not permit slippage of the ladder base when climbing (the minimum standard is a 4:1 vertical to horizontal ratio). Unsecured ladders must be supported by a ground worker until the climber has secured (tied) the ladder and transferred to the structure. Reference 29 CFR 1910.23 "Ladders".

- 100 Percent Attachment. Transitioning to the work position must be accomplished while maintaining 100-percent attachment (tie-off) using a full body harness and lanyard or lifeline with an energy absorbing or self-retracting lanyard or lifeline. 100 percent attachment (tie-off) is not required while using approved work platforms that have guardrails and kickboards in accordance with 29 CFR 1910.29, “Duty to ahve fall protection and falling object protection,” and 29 CFR 1910.25, “Stairways.” Refer to RSHS Section 1.11, Walking and Working Surfaces, for specific information.
- Signage. The tower site must include all applicable warning and danger signs, such as those shown in Figure 4.08-1, in prominent locations.

FIGURE 4.08-1 Examples of warning and danger signs that my be required at tower sites.

- First Aid Kits. First aid kits that meet the requirements of 29 CFR 1910.151 and ANSI Z308.1, as outlined in RSHS Section 1.05, Medical Services and First Aid, are required on site at all towers.
- Site Access Controls. The tower site must have access controls such as gates, fences, lockouts for ladders, anti-climb devices, etc., to prevent unauthorized access and climbing by unauthorized persons.
- Fencing Around Towers. All towers and supporting equipment shall be enclosed by fencing not less than six feet in height. Guy anchors, if present, shall also be enclosed with six-foot fencing for protection. If this is not feasible, then supporting documentation must be provided in the formal inspection.
- Tower Lighting and Painting. Tower lighting and painting must meet the requirements of 47 CFR 17, Construction, Marking, and Lighting of Antenna Structures.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at:
https://www.usbr.gov/safety/rshs/index.html.

Section 4.09 Work Zone Safety

1. Scope

This section establishes work zone safety requirements for Bureau of Reclamation (BOR) projects where personnel are working along public roadways, bridges, and private roads open to the public.

2. General Requirements

Reclamation projects must use a site-specific Temporary Traffic Control (TTC) plan for public roadways, bridges, and private roads open to the public, where work is performed on or within 15 feet from the edge of the roadway. The TTC plan must accommodate the needs of all impacted road users (motorists, bicyclists, pedestrians) when designed. When a reclamation project occurs off reclamation-managed roadways, BOR shall collaborate with the controlling entity (city, county, state, federal, sovereign nation) with jurisdictional roadway authority to develop the TTC. The details in the TTC plan depend on the type of roadway, traffic volume, road conditions, duration of operation, physical constraints, and the proximity of the work activity to road users.

3. Responsibilities

An internal traffic control plan to guide the flow of equipment and personnel (workers and public) is required where construction vehicles, equipment, and personnel on foot are operating within or adjacent to the work zone. All traffic control on Reclamation projects must conform to the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, 2009 Edition, December 2009 (including Revision 1 dated May 2012 and Revision 2 dated May 2012), (“MUTCD”) IBR approved for 29 CFR 1926.200(g) and 29 CFR 1926.201(a).

a. Area, Facility, Powerplant Managers and Contractors

- Shall provide work zone safety training to employees.

b. Regional Safety Managers/Area Office Safety Professionals

- Shall conduct periodic reviews of local work zone traffic control elements as part of normally scheduled safety and occupational health program evaluations. Use Appendix 4.09-A: Work Zone Traffic Control Inspection Form, or a similar product for work zone traffic control inspections.

c. First-Line Supervisors

- Shall ensure that training is provided to employees based on their area of responsibility in the TTC plan (e.g., flagger, spotter, dump person, equipment operator, construction inspector, safety office inspector, COR).

- Shall collaborate with employees to design/select project-specific TTC plans. First-line supervisors or their trained designee must communicate any changes to the TTC plan during the project's duration.
- Shall provide employees with high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107–2004 publication entitled "American National Standard for High-Visibility Apparel and Headwear" and shall be labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure.

d. Employees

- Shall obtain work zone safety and job-specific training for their role in the TTC plan (e.g., flagger, spotter, dump person, equipment operator, construction inspector, safety office inspector, safety office inspector, COR).
- Employees not trained in work zone safety must be accompanied by trained personnel when visiting the work zone.
- Shall follow all work zone safety requirements and report any concerns regarding work zone safety and health to their supervisors.
- Shall follow site-specific TTC requirements and complete Personal Protective Equipment (PPE) training for high-visibility safety apparel in work zones and flagger training as applicable.

e. Visitors/Dignitaries

- Shall get approval from the area manager or COR before visiting.
- Shall receive project-specific hazard awareness training from trained personnel before entering the project/work zone.
- Shall be accompanied by trained personnel while visiting the project/work zone.
- Shall wear proper PPE while in the project/work zone.

4. Training Requirements

a. Initial

Employees working on or within 15 feet of the edge of any roadway shall complete a training program that covers the areas listed below:

- work zone traffic control principles,
- the four parts of a work zone,
- basic traffic control plans,
- PPE requirements (head protection, eye protection, American National Standards Institute (ANSI) class 2 or 3 garment, boots),
- selecting the best TTC plan for the task,
- work zone device placements and spacing (signs, cones, barricades),
- entering and exiting the work zone,

- techniques for reducing risk while working next to traffic in the work zone on foot or in equipment,
- understanding internal traffic control plans for equipment and personnel,
- work zone hazard identification,
- proper placement of traffic control devices,
- planning for emergency vehicles,
- communicating during the work and during an emergency,
- routine inspections of traffic control devices,
- driver tendencies in the work zone,
- how to minimize exposure times in the work zone,
- providing positive guidance to the motorist,
- providing adequate advance warning time to motorists,
- night work, lighting requirements, and PPE requirements,
- dealing with angry motorists, and
- the difference between a spotter, a dump person, and a flagger.

An American Traffic Safety Services Association (ATSSA) flagger course or an individual State's Department of Transportation Flagging Course will meet the initial training requirements of Section 4.09.4.a.

b. Advanced Traffic Control Training

Employees tasked with reviewing traffic control plans or traffic control device placement on construction projects where contractors are involved shall first complete an ATTSA flagger course or an equivalent State's Department of Transportation Flagging Course and then complete the ATTSA traffic control technician (TCT) or ATTSA traffic control supervisor (TCS) course or equivalent training that meets ATTSA TCT or TCS requirements, depending on your specific duty requirements.

c. Certification

Flaggers shall complete an American Traffic Safety Services Association flagger course or an individual State's Department of Transportation Flagging Course, where a certificate or flagger card is issued or an equivalent sponsored training that meets the requirements below and issues a certificate of completion:

- flagger qualifications,
- flagger attributes,
- flagger responsibilities,
- flagger hand signals,
- using a stop/slow paddle, and
- flagger station requirements and escape routes.

d. Refresher/Recertification

Flagger recertification frequency shall follow more stringent Federal or State requirements but, at a minimum, shall be required every four years.

e. Recordkeeping

Reclamation managers and supervisors are responsible for documenting all work zone- related safety training. All records created shall be managed per the Information Management Handbook referenced in Reclamation Manual Directive and Standard, Department of the Interior's, Information Management (RCD 05-01).

5. Pre-job Briefing and Planning Requirements

All responsible parties shall prepare and understand the project's TTC plan before occupying the site. The supervisor or lead person most knowledgeable in proper TTC practices shall approve any changes in the TTC plan.

6. Personal Protective Equipment (PPE)

All workers within the right-of-way who are exposed to traffic (vehicles using the roadway for purposes of travel) or to work vehicles and construction equipment within the TTC zone shall wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the ANSI/International Safety Equipment Association 107–2004 publication, American National Standard for High-Visibility Safety Apparel and Headwear, or equivalent revisions, and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Employees working during daylight hours shall be provided and wear ANSI Performance Class 2 garments. Employees working at night shall be provided and wear ANSI Performance Class 3 garments.

7. Temporary Traffic Control Devices

All TTC devices manufactured before December 31, 2010, shall meet the crashworthy performance criteria in the National Cooperative Highway Research Program Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. TTC devices manufactured after January 1, 2011, must follow the American Association of State Highway and Transportation Officials Manual for Assessing Safety Hardware standards. MUTCD crashworthiness provisions apply to all streets, highways, and private roads open to public travel. Crashworthiness and crash testing information on devices described in Part 6 of the MUTCD are found in the American Association of State Highway and Transportation Officials, Roadside Design Guide. Traffic control devices are all signs, signals, markings, and other devices used to regulate, warn, or guide road users placed on, over, or adjacent to a street, highway, or private road open to public travel.

8. Communication Requirements

Flaggers, equipment operators, and ground personnel in the work zone shall establish a communication plan for normal operations, traffic control, and emergency stoppages as part of the overall TTC plan.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 4.09-A: Work Zone Traffic Control Inspection Form

Appendix 4.09-A (Work Zone Traffic Control Inspection Form) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Chapter 4 | Section 4.09, Appendix A

WORK ZONE TRAFFIC CONTROL INSPECTION FORM

Project No.			**Date/time**		
Location			**City**		**State**
Lane Width		**No. of Lanes**		**Posted Speed Limit**	MPH
Weather/Lighting Conditions			**Project Type**		
Competent Person					
Work Duration *(Check One)*	☐ Long-Term Stationary		☐ Intermediate-Term Stationary		
☐ Short-Term Stationary		☐ Short-Duration		☐ Mobile	

ADVANCE WARNING SIGNS

SIGN QUANTITY:		
Appropriate No. Of Signs	☐ Yes	☐ No *(If No, Explain)*
Missing Sign Series	☐ Yes	☐ No *(If Yes, Explain)*
Missing Specific Sign(s)	☐ Yes	☐ No *(If Yes, Explain)*

SIGN CONDITION	Good	Fair	Poor
Cleanliness			
Legibility			
Reflectivity			

LEGENDS	Good	Fair	Poor
Appropriate Legends			
Unneeded Signs Visible			
Signs Posted, No Work			

SIGN PLACEMENT	Good	Fair	Poor
Height			
Visibility			
Spacing			

ARROW PANEL A, B, C, or D	Good	Fair	Poor
Placement			
Delineated/Shielded			
Removed When Not In Use			

NON-STANDARD SIGNS			
Appropriate Legend		**Shape**	
Color		**Size**	

Overall Advance Warning: Excellent_____ **Adequate**_____ **Inadequate**_____

Comments:

CHANNELIZING DEVICES

TYPE OF UPSTREAM TAPER *(Check One)*			
☐ Merging	☐ Shifting	☐ Shoulder	☐ One-Lane, Two-Way

DOWNSTREAM TAPER *(Optional)*				
USED	☐ Yes	☐ No	Taper Length	Select One

CHANNELIZING DEVICE CONDITION							
DEVICE	Good	Fair	Poor	DEVICE	Good	Fair	Poor
Barricades Type I, II, or III				Tubular Markers			
Drums				Vertical Panels			
Cones				Warning Lights			

CHANNELIZING DEVICE CONDITION *(Continued)*			
Appropriate Ballasting	☐ Yes	☐ No	*(Explain)*
Appropriate Battery Mount	☐ Yes	☐ No	*(Explain)*
Adequate Spacing	☐ Yes	☐ No	*(Explain)*
Adequate Taper Length	☐ Yes	☐ No	*(Explain)*
Appropriate No. of Devices	☐ Yes	☐ No	*(Explain)*
Non-Standard Device	*(Explain)*		

Overall Channelization: **Excellent**_____ **Adequate**_____ **Inadequate**_____

Comments

PAVEMENT MARKINGS

USE OF PAVEMENT MARKINGS			
Markings Used	☐ Yes	☐ No	
Easily Understandable	☐ Yes	☐ No	*(If No Explain)*

CONDITION	Good	Obscured	Faded	Damaged/Dislodged
Paint / Tape				
Raised Markers				

Overall Pavement Marking: **Excellent**_____ **Adequate**_____ **Inadequate**_____

Comments

FLAGGING

FLAGGER USE						
Flagger(s) Used	☐ Yes	☐ No	No. of Flaggers			
Flagger Station Preceded By Advance Warning Signs	☐ Yes	☐ No *(Explain)*				
Flaggers Are Clearly Visible To Approaching Traffic	☐ Yes	☐ No *(Explain)*				
Approaching Traffic Has Sufficient Distance To Stop	☐ Yes	☐ No *(Explain)*				
Flagger Stations Illuminated (Night Time)	☐ Yes	☐ No	☐ N/A			
Signaling Device	☐ Slow/Stop Paddles	☐ Flags				
Communication Used Between Flaggers	☐ Visual Contact	☐ Two-Way Radio Contact				
Flagging Technique	☐ Good	☐ Fair	☐ Poor			

FLAGGER ATTIRE		
High-Visibility Apparel	☐ Yes	☐ No
Hard Hats	☐ Yes	☐ No

Overall Flagging: **Excellent**_____ **Adequate**_____ **Inadequate**_____

Comments

ROADSIDE SAFETY

Type of Barrier	☐ Concrete	☐ Timber Curb	☐ Guide Rail	☐ Other		
Barrier Condition	☐ Good	☐ Fair	☐ Poor *(Explain)*			
Flared End Treatment Needed	☐ Yes	☐ No	Impact Attenuator Needed	☐ Yes	☐ No	

BARRIER DELINEATION				
Lights	☐ Good	☐ Fair	☐ Not Working	
Reflectors	☐ Good	☐ Fair	☐ Poor	☐ Too Small
Adequate Drop-Off Delineation	☐ Yes	☐ No *(Explain)*		
Adequate Clear Zone	☐ Yes	☐ No *(Explain)*		

Overall Roadside Safety: **Excellent**_____ **Adequate**_____ **Inadequate**_____

Comments

INTERNAL TRAFFIC CONTROL

INTERNAL TRAFFIC CONTROL PLAN REQUIREMENTS	YES	NO
Contact Information For The General Contractor And Subcontractors Available		
All Site Personnel Have Been Trained on The Specific Internal Traffic Control Plan (ITCP)		
Worker and Visitor Parking Areas Have Been Designated		
Independent Truck Drivers Have Been Oriented Prior to Entering The Work Space		
Areas Around Specific Pieces of Equipment and Operations Have Been Delineated		
Locations For Storing Materials And Servicing Equipment Have Been Designated		
Internal Signs And Traffic Control Devices Have Been Posted/Erected		
Speed Limit Within The Work Zone Has Been Posted		
Adequate Lighting Has Been Provided For Night Operations		
Channels Of Communication Regarding Changes To The ITCP Have Been Designated		
Communication Between Workers On Foot And Equipment Operators Has Been Established		
Communication Between Equipment Operators Has Been Established		

Overall Rating For The ITCP: Excellent_____ Adequate_____ Inadequate_____
Comments

MISCELLANEOUS TRAFFIC CONTROL

CONDITION				YES	NO	EXPLANATION
Unprotected Operations or Equipment In Roadway				☐	☐	*(If Yes, Explain)*
Temporary Traffic Signal Operation/Installation Effective				☐	☐	*(If No, Explain)*
Original Signs/Delineation In Good Condition				☐	☐	*(If No, Explain)*
Posted Speed Limit	MPH	☐ Appropriate	☐ Too Fast	☐ Too Slow		
Access Control	☐ Good	☐ Fair	☐ Poor			
PEDESTRIAN SAFETY						
Adequate Travel Path	☐ Yes	☐ No	Adequate Protection From Hazards	☐ Yes	☐ No	

Overall Misc. Traffic Control: Excellent_____ Adequate_____ Inadequate_____
Comments

OVERALL RATING: Excellent_____ Adequate_____ Inadequate_____

Section 4.10 RESERVED FOR FUTURE CONTENT

Section 4.11 Watercraft and Dredging

1. Scope

This section sets forth the safety requirements for Bureau of Reclamation watercraft and dredging activities. These include requirements for equipment as well as inspections, training, certification, and various operating activities.

2. General Requirements

Ensure that all watercraft and dredges are operated in compliance with this section, as well as applicable U.S. Coast Guard (USCG), Department of the Interior Department Manual (485 DM 22), and U.S. Army Corp of Engineers Dredging Operations Technical Support programs.

3. Responsibilities

a. Reclamation Watercraft Safety Working Group

- Shall appoint a Reclamation Watercraft Working Group member as the Reclamation Watercraft Safety Coordinator.
- Shall submit requests for Personal Flotation Device (PFD) deviations to the Policy and Programs Director.
- Shall identify courses that are approved for use in completing the Motorboat Operator Certification Course (MOCC) refresher training education module.

b. Reclamation Water Safety Coordinator

- Shall serve as the watercraft safety program point of contact for Reclamation and facilitate watercraft safety activities and operator training.
- Shall successfully complete MOCC and Motorboat Operator Instructor Certification Course (MOICC) training.
- Shall serve as the Reclamation representative on the Department of the Interior (Interior) Watercraft Safety Working Group.

c. Regional Watercraft Program Coordinators/Lead Instructors

- Shall serve as members of the Reclamation Watercraft Safety Working Group.
- Shall successfully complete MOCC and MOICC training.
- Shall coordinate/instruct MOCC training for their respective regions.
- Shall report/track regional MOCC training/refresher information to the Reclamation Watercraft Safety Coordinator. All watercraft/dredge training records shall be kept in the Interior learning management system.

d. Regional Safety Managers

- Shall designate an MOCC instructor to serve as Regional Watercraft Program Coordinator/Lead Instructor.
- Shall submit requests for PFD deviations to the Policy and Programs Director.

e. First-Line Supervisors

- Shall establish protocols to ensure that all personnel and volunteers meet the following requirements:

    - conduct watercraft and dredging operations in a safe manner and in compliance with this section,
    - maintain equipment in compliance with this section and with existing policies and procedures, and
    - operators have the skills needed for conditions in which they are expected to operate watercraft and dredges.

- Shall ensure that employees who operate and work in watercraft and dredges have training in watercraft operations appropriate for the size/type of watercraft used; geographic, climatic, and physical nature of the operations; and operational tasks being performed.
- Shall review the float plan (for watercraft operations), job hazard analysis (JHA), and/or conduct the safety briefing (for dredge operations) developed by the watercraft/dredge operators prior to operation.
- Shall provide the safety and survival equipment identified on the float plan, JHA, and/or during safety briefing.

f. Watercraft/Dredge Operators

- Shall successfully complete the training as stated in this section and required by 485 DM 22.
- Shall conduct watercraft and dredging operations in a safe manner and in compliance with this section.
- Shall ensure that personnel maintain equipment in compliance with this section and existing policies and procedures.
- Shall prepare the float plan, JHA, and/or safety briefing for first-line supervisor review/approval prior to watercraft/dredge operations.
- Shall conduct onsite risk assessment with crew, checking equipment, weather, and site conditions prior to watercraft/dredge operations.
- Shall conduct a review of the float plan, JHA, and/or safety plan with watercraft/dredge occupants directly before the watercraft/dredge activity commences.

- Shall ensure safety of the crew members and other onboard personnel and operate the watercraft/dredge in compliance with this section and existing policies, guidelines, and training.
- Shall report any accident, injury, property damage, or near-miss incident that occurs during the watercraft/dredging operation to the first-line supervisor.

4. Training Requirements

a. Initial

Reclamation employees and others who operate Reclamation-owned watercraft or dredges must first be trained and certified to operate watercraft in accordance with this section and with 485 DM 22. Non-Reclamation personnel who operate government watercraft for Reclamation activities must be qualified in accordance with USCG, State, and local regulations.

- MOCC Training. Reclamation employees must successfully complete Interior's MOCC training before operating motorboats. Anyone operating motorboats/dredges for which Reclamation is responsible (e.g., Reclamation-owned, borrowed, rented or leased) must successfully complete MOCC training. Reclamation employees can complete MOCC training through any Interior agency. MOCC training is valid for five years.
- Preparation for MOCC. In preparation for taking the MOCC or an MOCC module, Reclamation employees may practice elementary operating skills under the onboard supervision of an MOCC instructor.
- Training Substitute. Operators may substitute similar watercraft training for the MOCC if it meets or exceeds the MOCC standard. Operators must submit requests for substitutions to the Reclamation Watercraft Safety Working Group for approval.
- USCG Licensing. Reclamation employees operating watercraft normally subject to USCG licensing regulations (e.g., watercraft longer than 65 feet) will be trained and licensed in accordance with the requirements in 46 CFR 25.

b. Non-Motorized Watercraft

Operators of non-motorized watercraft are exempt from MOCC completion. However, first- line supervisors must ensure operators are provided with practical operator safety training pertinent to the watercraft (e.g., raft, kayak) and environmental conditions in which the watercraft is operated. Appropriate training includes, but is not limited to, the non-motorized module of the MOCC.

c. MOCC Instructors

Reclamation employees who serve as MOCC instructors must successfully complete both the MOCC and MOICC as outlined in Interior's MOCC Instructor Manual.

d. Dredge and Related Equipment Inspectors

Employees who inspect dredges and related equipment must have a certificate, license, or professional standing, as well as extensive knowledge, training, and experience in solving problems related to the work.

e. Recertification

- Watercraft/Dredge Operators. Must successfully complete MOCC recertification every five years in accordance with 485 DM 22.
- MOCC Instructors. Must participate in providing instructions in at least one MOCC every three years to maintain instructor certification. MOCC instructors who do not meet this requirement must successfully complete the MOICC prior to conducting MOCC training.

f. Proficiency Qualification

In addition to ensuring that operators successfully complete MOCC training, first-line supervisors must ensure they receive training on the specific watercraft in the environmental conditions and in the area that they will be operating.

g. Recordkeeping

Ensure all records are maintained in accordance with Reclamation Manual Directives and Standards, Information Management (RCD 05-01) and all watercraft/dredge training records shall be kept in the Interior official repository.

5. Hazard Identification, Assessment, and Safety Measures

a. Entering Water

There may be times when the watercraft operator needs to enter the water (e.g., when an object is wrapped around the watercraft prop or to remove the boat from a sandbar). The operator shall ensure that the JHA addresses this possibility. When entering the water, observe and address the following:

- place watercraft controls in gear to guard against accidental starting of the motor,
- remove the key from the ignition,
- display an orange flag to alert others to the fact that someone is in the water,
- turn off all generators, and
- ensure that no sources of carbon monoxide are present.

6. Pre-job Briefing and Planning Requirements

a. Float Plans

Prior to using a watercraft, the operator must provide a float plan to their first-line supervisor. The float plan must include the following information:

- watercraft information (vessel make/model or local identifier),
- emergency equipment onboard,
- personnel onboard,
- activity and purpose of the trip,
- planned route,
- point of departure,
- expected time of departure,
- route,
- expected time of return,
- means of communication (e.g., Very High Frequency (VHF) radio, cell phone) and contact schedule,
- description of vehicle(s) left at launch site, and
- plan of action if overdue.

b. Safety Plans for Dredging Operations

Prepare a comprehensive safety plan for each dredging operation. Make the plan location specific and include provisions for communications and emergency response.

c. Job Hazard Analysis

Prepare a JHA for watercraft and dredging operations. Review the JHA with all employees involved with the watercraft/dredge operation prior to starting the work, at the beginning of each work shift, and anytime the JHA is modified. The first-line supervisor must approve and sign the JHA.

7. Hazardous Environmental Conditions (Weather/Other)

a. Weather

The watercraft/dredge operator shall monitor the National Weather Service warnings (e.g., small watercraft advisories) when planning watercraft/dredging operations. The operator shall re-evaluate and terminate operations, if determined appropriate, for all watercraft/dredge operations during high winds, high flows on a river, or other weather conditions which may adversely affect watercraft/dredge operations.

b. Lightning

The watercraft/dredge operator shall terminate or reschedule watercraft/dredging operations when lightning is present. Seek shelter off the water.

8. Personal Protective Equipment (PPE)

a. PFD Use During Watercraft/Dredging Activities

Equip watercraft with one USCG-approved PFD for each occupant, and one USCG- approved throwable device onboard the watercraft. Wear a PFD whenever onboard a watercraft or

working around bodies of water where a drowning hazard exists. Employees must wear and maintain PFDs as directed by the manufacturer's instructions (e.g., properly zipped, tied, latched). PFDs must be worn as the outermost layer. Personnel using floating pipelines as accessways or working on the pipeline must wear a USCG-approved PFD.

- Design. The PFD will be either "international orange" or "fluorescent yellow-green" and will have at least 31 square inches (200 square centimeters) of retroreflective material attached to both the front and the back, in the upper quadrants of the PFD. If the PFD is reversible, retroreflective material will be attached to each of its reversible sides. In accordance with 46 CFR 25.25-13, each PFD shall be equipped with a beacon securely attached to the front shoulder when onboard watercraft being operated in coastal waters, the ocean, sea, or Great Lakes.
- Inspection and Replacement. Before each use, the operator shall visually inspect each PFD for defects that will compromise its strength or buoyancy. Check the PFD for rips, tears, sun damage, or holes, and ensure that seams and fabric straps are in satisfactory condition There must be no signs of waterlogging, mildew, or shrinkage of the buoyant materials. Metal or plastic hardware used to secure the PFD on the wearer must not be broken, deformed, or weakened by corrosion. Webbing or straps used to secure the PFD on the wearer must not be ripped, torn, or separated from the attachment point on the PFD. If any defects are found, do not use the PFD and replace the device immediately. Follow the PFD manufacturer's recommended timeframe for removal from service.
- Auto-Inflatable PFDs. The regional watercraft coordinator must authorize the selection of USCG-approved auto-inflating PFDs. Additionally, users must visually inspect the PFD before each use to ensure that the inflator mechanism is armed and in good condition. Type III PFDs are manually inflatable with automatic backup. Users should always manually inflate the PFD and not wait for automatic inflation. The bladder must not leak, and the user must be familiar with its use and operation. Auto-inflating PFDs must be maintained and inspected based on the manufacturer's recommendations. At the beginning of the boating season, inflate each inflatable PFD to ensure the CO2 cylinder, bobbin, and all other parts are in good working order. First line supervisors shall designate an employee to complete this inspection every two to three months if the vests are worn regularly, or if the boating location is hot and humid, since the inflation mechanism may be subject to corrosion. Auto-inflating PFDs are sensitive to damage and must be stored appropriately so functionality is not compromised.

b. Cold Weather PPE

Cold weather PPE (e.g., USCG-approved exposure suits and/or immersion suits) will be worn when the sum of air and water temperatures is less than 100 degrees Fahrenheit. The watercraft operator may make an exception to this requirement if determining that the risks associated with wearing cold weather PPE (e.g., crew performance degradation, thermal stress)

are offset by the benefits of not wearing cold weather PPE. Prior to use, personnel will be trained in the use of this equipment.

9. Other Safety Equipment

Equip all watercraft and dredges with adequate safety equipment to meet USCG requirements and to address any hazards that operators may encounter during normal operations. The following equipment must be available on all motorized watercraft and considered for all non-motorized watercraft:

- visual distress signals (e.g., orange distress flag, distress light, three day/night red flares),
- sound producing device, and
- re-entry ladder or other means of assisting someone with getting back into the watercraft (e.g., cavitation plate).

a. Flame Arrestors

Equip gasoline engines, except for outboard types, with a USCG-approved backfire flame arrestor. Make sure the arrestor is attached to the air intake with a flame-tight connection. It must be kept clean and in serviceable condition.

b. Fire Extinguishers

- Less than 26 feet in Length. For watercraft less than 26 feet in length, at least one USCG-approved fire extinguisher, rated B-1 or greater, must be carried onboard.
- 26 feet up to 40 feet. For watercraft from 26 feet to 40 feet in length, either one Type B-2 or two Type B-1 extinguishers must be carried onboard.
- 40 feet up to 65 feet. For watercraft from 40 feet to 65 feet in length, either one Type B-2 and one Type B-1 or three Type B-1 fire extinguishers must be carried onboard.
- Greater than 65 Feet. Watercraft that are 65 ft or greater in length must carry enough fire extinguishers to meet USCG requirements.
- Watercraft with Powerplants in Confined Locations. Watercraft with gasoline or liquid petroleum gas powerplants located in a compartment or confined location must have a fixed carbon dioxide (or equivalent) fire-extinguishing system meeting the requirements of 46 CFR 25.30-15.
- Inspection. Portable fire extinguishers shall be maintained and inspected monthly if possible, but at a minimum prior to each vessel use in accordance with Reclamation Safety and Health Standards (RSHS) Section 1.09, Fire Protection and Prevention.

c. Navigation Lights

Watercraft and dredges must be equipped with navigation lights required by USCG. Operators must display navigation lights between sunset and sunrise and any other time of reduced visibility (e.g., fog, haze, rain).

d. Pipeline Marking

Dredge pipelines that float or are supported on trestles must display appropriate lights at night and when visibility is restricted, in accordance with USCG regulations and 33 CFR 88.15.

10. Safe Practices

a. Watercraft Inspection

Inspect all watercraft and equipment according to applicable USCG regulations and other jurisdictional entities before placing them in service.

- Preventing the Spread of Aquatic Invasive Species
    - Clean any visible mud, plants, fish, or animals from the watercraft before transporting equipment. Any items found shall be disposed of properly.
    - Drain all water holding compartments including ballast tanks, live wells, and bilge areas.
    - Dry all boats, trailers, and equipment which is the most effective way to prevent the spread of invasive species.

b. Watercraft/Dredge Loading

Ensure watercraft/dredge has enough room, freeboard, and stability to safely carry the cargo and passengers, based on the watercraft's capacity plate, under various weather and water conditions. Document this information on the JHA.

c. Watercraft Ventilation

Watercraft with installed inboard gasoline engines must have powered ventilation systems to remove gasoline vapors from the vessel.

d. Watercraft Fuel for Barges

Store fuel in USCG-approved, marine-specific, containers. Fuel lines must be equipped with a valve to cut off fuel flow. In addition, the operator must close the valve if the watercraft will not be used for a period of eight hours or longer.

e. Kill Switch

Open cabin launches or motorboats will be equipped with kill (dead man) switches when there is a risk that the watercraft operator can be thrown overboard or away from the controls, except in rare instances when doing so increases the risk to personnel (e.g., operating upstream from a significant hazard, operating in extremely rough water, or performing a rescue). If a kill switch tether increases the risk to personnel, use a non- direct/wireless kill switch during the watercraft operation. When the use of a kill switch during a specific watercraft/dredge operation is determined to pose a greater hazard than not using a kill switch, and using a non-direct/wireless kill switch is not feasible, the watercraft operator must identify measures to prevent injuries associated with the operation on the JHA.

f. Watercraft Inspections

The local fleet manager shall ensure that a qualified/competent technician/mechanic inspects watercraft and their trailers at least annually. Document trailer inspections on Reclamation Form 7-1776B and watercraft inspections on Reclamation Form 7-1776C (see 28.13 References for intranet link to forms).

g. Dredge and Related Equipment Inspections

A qualified person must inspect dredges and related equipment before they are entered into service, and at least annually thereafter, to ensure that they are in safe operating condition. The inspector must be trained and certified in accordance with paragraph 4.11.4.d, Dredge and Related Equipment Inspectors. Inspections must be documented and accessible to personnel.

h. Maintenance and Repair of Dredges and Related Equipment

Employees must raise the ladder (or drag arm) above the water line and secure it before performing repairs or maintenance work on the pump, suction, or discharge lines below the water line or within the hull, in additional to the normal process of securing hoisting machinery. Set blank or block plates in suction or discharge lines as appropriate. See also RSHS Section 1.13, Control of Hazardous Energy (Lockout/Tagout).

i. Submerged Dredge Pipelines

- Crossings. Where a pipeline crosses a navigation channel or other area subject to boat traffic, submerged pipeline must rest on the channel bottom. The top of the pipeline and any anchor securing the pipe must be no higher than the maximum draft or traffic expected in the vicinity of the pipe.
- Submerged Pipeline. When buoyant or semi-buoyant pipeline is used, the dredge operator must ensure that the pipeline remains fully submerged and on the bottom. When raising the pipeline, warn boat traffic of the pipeline hazard. Mark the entire length of the pipeline as required by USCG.
- Marking. Mark the entire location of the submerged pipeline with signs, buoys, lights, or flags as required by USCG and as approved by the authority having jurisdiction. Unless otherwise specified by USCG, submerged pipelines require special markings and must have a USCG-approved flashing yellow light.

    - Indicators. Dredge Operators must place indicators, such as signs or buoys that state “DANGER SUBMERGED PIPELINE” at the beginning and end of the pipeline. In addition, indicators are required in areas where the charted depth reduces by more than 10 percent, and, at a minimum, every 1,000 feet (304.8 meters) to clearly warn of the pipeline length and course.
    - Anchoring. If barges or other vessels are used to anchor the beginning and/or end of the submerged pipeline, they must be lighted in accordance with 33 CFR 88.13.
    - Navigation Channels. Within a navigation channel, each end of the pipeline must be identified with a regulatory marker buoy.

  - Increased Depth. Lengths of submerged pipeline located outside of the navigation channel, which reduce the charted depth by more than 10 percent, must be identified with high visibility buoys marked with 360-degree visibility retro-reflective tape (e.g., orange neoprene buoys) placed at an interval not to exceed 500 feet (152.4 meters) to clearly show the pipeline length and course.

- Inspections. Conduct routine (e.g., daily or weekly) inspections of the submerged pipe to ensure anchorage.
- Removal. Remove all anchors and related materials when removing the submerged pipe.

j. Floating Pipeline

Clearly mark floating pipelines, including rubber discharge hoses. Do not allow pipelines to fluctuate between the water surface and the channel bottom or to lie partially submerged. If floating pipelines are used as accessways, equip them with a walkway and handrail on one side.

k. Dredge Design

Design dredges to ensure that a failure or rupture of any of the dredge pump components (including dredge pipe) will not cause the dredge to sink.

- Dredge Pumps. Any dredge with a dredge pump below the water line must have a bilge alarm or automatically shut down in the event of a pump leak.
- Fall Protection. Provide guardrails, bulwarks, and self-closing gates for deck openings, elevated surfaces, and other locations where a person may slip or fall. Guardrails and self-closing gates must comply with the requirements for standard guardrails in accordance with RSHS Section 1.11, Walking and Working Surfaces, and 29 CFR 1910.29(b)(13).

l. Walking and Working Surfaces

- Anti-Slip Surfaces. Provide anti-slip surfaces on all working decks, stair treads, vessel ladders, and other walking or working surfaces that may become wet during operations.
- Obstructions. Remove obstructions in walking and working surfaces when possible. Where obstructions cannot be removed, post appropriate warning signs, or distinctively mark them in accordance with RSHS Section 1.08, Signs, Signals and Barricades, and American National Standards Institute (ANSI) Z535.1.
- Gangways. Where the distance between the vessel and docks or landings exceeds 18 inches horizontal or 12 inches vertical, provide gangways. Gangways must be at least 22 inches wide, with standard railings, and be able to support 250 pounds (with a safety factor of 4:1) at its midpoint.

m. Relocation of Dredges and Related Equipment
A qualified person must directly supervise any mobilization, demobilization, or relocation of dredges, support barges, and other support equipment.

11. Communication Requirements

a. Equipment
Always carry at least one communication device, whether that is a cell phone, a satellite phone, or a VHF marine radio. If the device is not waterproof, place it in a waterproof container that will float with the device inside. Make test call from chosen communication equipment with local or responding entity to work location in order to facilitate familiarity and signal coverage. An emergency position indicator radio beacon or personal locator beacon that has global positioning system capability shall be used in the following situations:

- boating operations on large bodies of water,
- work requiring overnight boat operations,
- work on water in remote areas where other communication devices are non- functional, and
- work on water areas where signal coverage is weak or unavailable.

b. Public Notification of Dredging Operations
Issue public notices where dredging activity may pose hazards to navigation or to the public.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 4.12 Specialty Use Equipment

1. Scope

This section establishes safety requirements for specialty use equipment, which this RSHS defines as: all-terrain vehicles (ATV), utility terrain vehicles (UTV), snowmobiles, snow cats, burden carriers, and tow carts.

2. General Requirements

Qualified personnel must operate specialty use equipment in compliance with this section. All operators must be at least 18 years of age.

3. Responsibilities

a. Area, Facility, and Powerplant Managers

- Shall provide necessary support and resources to implement and maintain the requirements set forth in RSHS 4.12.
- Shall designate qualified trainers for each type of specialty use equipment utilized in their area.

b. First Line Supervisors

- Shall ensure that documented training and appropriate Personal Protective Equipment (PPE) are provided to employees assigned to operate specialty use equipment and that employees are proficient and qualified, as required by this RSHS.
- Shall assign only trained and qualified employees to operate specialty use equipment.
- Shall ensure that a Job Hazard Analysis (JHA) is prepared for all projects or activities using specialty use equipment and for each type of utilized specialty use equipment. RSHS 1.04, Work Safety Planning, defines JHA requirements.

c. Employees

- Shall complete all training and evaluations for specialty use equipment the employee is assigned to operate, as required by this section.
- Shall inspect and perform maintenance on all specialty use equipment per the operator's manual and as required by this section.
- Shall demonstrate proficiency to operate specialty use equipment.
- Shall meet the DOT licensing requirements for on-highway operations and comply with applicable manufacturer requirements and OSHA standards on jobsites where DOT is not applicable.
- Shall comply with applicable operating instructions, limitations, regulations, and written safety programs and plans.

- Shall participate in the JHA process for the specialty use equipment they will be operating.
- Shall wear appropriate PPE for the specialty use equipment they are operating.

4. Training Requirements

a. Initial ATV

The initial training program requirements shall consist of the following:

- reviewing the operator's manual,
- understanding the characteristics of an ATV,
- required PPE (clothing, helmets, eye protection, boots, gloves),
- tire pressure and wheel tightness,
- controls: throttle and other cables, brakes, foot shifter,
- lights and switches: engine stop switch, lights (if equipped),
- oil and fuel: oil levels, gasoline and leaks,
- chain/driveshaft and chassis maintenance,
- tool kit,
- starting and stopping the ATV,
- correct riding posture,
- shifting gears, braking, and stopping,
- turning the ATV,
- reading terrain,
- riding up hills, riding down hills, and traversing a slope,
- riding with a passenger (if so equipped),
- riding different terrains`: dirt, snow, sand, mud, and water,
- crossing roads and highways,
- towing a trailer with an ATV (if applicable),
- understanding rider fatigue,
- trailering or hauling an ATV in a truck,
- hauling cargo with an ATV,
- first aid kit requirements and fire extinguishers,
- travel planning, working alone, and communication plans, and
- practical hands-on exercises performed by the trainee under direct observation of the trainer.

Trainer specific requirements also include:

- providing practical, hands-on training that includes demonstrations performed by the trainer,

- providing practical hands-on exercises performed by the trainee under direct observation of the trainer, and
- conducting the training on the type of equipment the trainee will be operating on the job. When differences exist between equipment used for training and equipment being used on the job, the trainer will explain those differences, in detail, to the trainee prior to use. Trainers shall complete a proficiency evaluation of each operator at the conclusion of the training.

b. Initial UTV

The initial training program requirements shall consist of the following:

- reviewing the operator's manual,
- understanding the features of a UTV,
- differences between UTVs and ATVs
- required PPE,
- pre- ride inspections,
- UTV components: steering wheel, seat belt, accelerator pedal, lights, ignition, parking brake, brake pedal, passenger seat, hand holds, taillights, roll over protection system,
- tire pressure and wheel tightness,
- two-wheel and four-wheel drive operations,
- oil and fuel: oil levels, gasoline, and leaks,
- driveshaft and chassis maintenance,
- tool kit,
- starting and stopping a UTV,
- shifting gears, braking, and stopping,
- cornering in a UTV,
- reading terrain,
- riding up hills, riding down hills, and traversing a slope,
- operating with a passenger,
- riding different terrains: dirt, snow, sand, mud, and water,
- crossing roads and highways,
- towing a trailer with a UTV (if applicable),
- understanding operator fatigue,
- trailering or hauling a UTV in a truck,
- hauling cargo with a UTV,
- first aid kit requirements and fire extinguishers,
- travel planning, working alone, and communication plans, and
- practical hands-on exercises performed by the trainee under direct observation of the trainer.

Trainer specific requirements also include:

- providing practical, hands-on training that includes demonstrations performed by the trainer,
- providing practical hands-on exercises performed by the trainee under direct observation of the trainer, and
- conducting the training on the type of equipment the trainee will be operating on the job. when differences exist between equipment used for training and equipment being used on the job, the trainer will explain those differences, in detail, to the trainee prior to use. Trainers shall complete a proficiency evaluation of each operator at the conclusion of the training.

c. Initial Snowmobile

The initial training program requirements shall consist of the following:

- reviewing the operator's manual,
- understanding the unique features of snowmobiles,
- required PPE and cold weather gear,
- pre-ride inspections,
- rules for trail riding and understanding trail signs,
- snowmobile components: handlebars, lights, ignition, brake handle, passenger seat (if applicable), hand holds, taillights, tracks, slide rails, throttle, idler/bogie wheels, skis, wear bars, kill switch, auto start button, pull cord, air intake.
- required safety equipment: shovel, Global Positioning System (GPS) satellite emergency notification device (send unit), avalanche beacon, snow probe, radio/cell phone, satellite phone (if send unit lacks two-way communication or radio and cell phone coverage is lacking) compass, map, waterproof matches/fire starter, flares, flashlight, spare batteries, extra ignition key, water, food, critical medications extra drive belt, ice picks if traversing frozen bodies of water (worn on wrists under jacket for self-rescue), and extra spark plugs,
- oil and fuel: oil levels, gasoline, and leaks,
- tool kit components for minor maintenance,
- starting a snowmobile,
- braking and stopping,
- cornering and weight transfer,
- reading terrain,
- riding up hills, riding down hills, and traversing a slope,
- operating with a passenger (only for snowmobiles meant for two persons),
- how to dig out a stuck snowmobile,
- being prepared to deal with an emergency (broken down, lost, stuck, injured),
- crossing roads and highways,

- towing a sled with a snowmobile (if applicable),
- understanding operator fatigue,
- trailering or hauling a snowmobile in a truck,
- hauling cargo on a snowmobile,
- first aid kit requirements and fire extinguishers,
- travel planning, working alone, and communication plans, and
- practical hands-on exercises performed in the field by the trainee under direct observation of the trainer.

Trainer specific requirements also include:

- providing practical, hands-on training that includes demonstrations performed by the trainer,
- providing practical hands-on exercises in the field performed by the trainee under direct observation of the trainer,
- conducting the training on the type of equipment the trainee will be operating on the job. When differences exist between equipment used for training and equipment being used on the job, the trainer will explain those differences, in detail, to the trainee prior to use. Trainers shall complete a proficiency evaluation of each operator at the conclusion of the training.

d. Initial Snowcat

The initial training program requirements shall consist of the following:

- reviewing the operator's manual,
- understanding the unique features of snowcats,
- required PPE and cold weather gear,
- pre- ride inspections,
- entering and exiting the snowcat safely with three points of contact,
- rules for trail riding and understanding trail signs,
- snowcat components: steering, lights, ignition, brake handle, hand holds, taillights, tracks, wipers, heater, and seatbelts/restraint systems,
- required safety equipment: shovel, GPS satellite emergency notification device (send unit), avalanche beacon, snow probe, radio/cell phone, satellite phone (if send unit lacks two-way communication or radio and cell phone coverage is lacking) compass, map, waterproof matches/fire starter, flares, flashlight, spare batteries, extra ignition key, water, food, critical medications oil, hydraulic and fuel: oil levels, hydraulic levels, and gasoline and leaks,
- tool kit components for minor maintenance,
- starting a snowcat,
- braking and stopping,

- cornering and weight transfer,
- reading terrain,
- driving up hills, down hills, and traversing slopes,
- operating with passengers,
- being prepared to deal with an emergency (broken down, lost, stuck, injured),
- crossing roads and highways,
- understanding operator fatigue,
- trailering a snowcat,
- hauling cargo with a snowcat,
- first aid kit requirements and fire extinguishers,
- travel planning, working alone, and communication plans, and
- practical hands-on exercises performed in the field by the trainee under direct observation of the trainer.

Trainer-specific requirements also include:

- providing practical, hands-on training that includes demonstrations performed by the trainer,
- providing practical hands-on exercises in the field performed by the trainee under direct observation of the trainer, and
- conducting the training on the type of equipment the trainee will be operating on the job. When differences exist between equipment used for training and equipment being used on the job, the trainer will explain those differences, in detail, to the trainee prior to use. Trainers shall complete a proficiency evaluation of each operator at the conclusion of the training.

e. Initial Burden Carriers/Tow Tractors/Tool Carts

The initial training program requirements shall consist of the following:

- understanding the characteristics of burden carriers/tow tractors/tool carts,
- required maintenance practices,
- performance limitations,
- primary surfaces for operation,
- tire pressure and wheel tightness,
- controls: steering, horn, parking brake, and reverse beeper (if equipped),
- lights and switches: engine stop switch, lights (if equipped), battery indicator, and directional signals (if equipped),
- oil and fuel (if applicable): oil levels, gasoline, and leaks,
- battery servicing and charging safety for electric powered equipment,
- new battery break in requirements,
- foot brake pedal,

- accelerator pedal,
- starting and stopping,
- turning and cornering safety,
- yielding right of way to pedestrians and emergency vehicles,
- keeping the vehicle under control at all times,
- not overtaking vehicles at intersections, blind spots, or other dangerous locations,
- maintaining safe following distances with other equipment,
- limitations for operating on inclines and declines (see owner's manual),
- riding with a passenger (if so equipped),
- loading and unloading,
- towing,
- crossing roads and highways,
- hauling cargo,
- travel planning, working alone, and communication plans, and
- practical hands-on exercises performed by the trainee under direct observation of the trainer.

Trainer specific requirements also include:

- providing practical, hands-on training that includes demonstrations performed by the trainer,
- providing practical hands-on exercises in the field performed by the trainee under direct observation of the trainer, and
- conducting the training on the type of equipment the trainee will be operating on the job. When differences exist between equipment used for training and equipment being used on the job, the trainer will explain those differences, in detail, to the trainee prior to use. Trainers shall complete a proficiency evaluation of each operator at the conclusion of the training.

f. Equipment Specific Instructor and Operator Training Requirements

- ATV Qualified Instructor. Qualified instructors must complete an ATV Safety Institute Rider Course Instructor Certification training, or an equivalent ATV instructor course that meets the criteria outlined in paragraph 4.12.4.a, "Initial ATV," above.
- ATV Operator. ATV operators must complete an ATV Safety Institute Rider Course Certification training or equivalent ATV training course that meets the requirements of paragraph 4.12.4.a, above.
- UTV Qualified Instructor. Qualified instructors must complete a UTV instructor course that meets the requirements of paragraph 4.12.4.b, "Initial UTV," above.
- UTV Operator. Operators shall complete a UTV operator training program that meets the requirements of paragraph 4.12.4.b, above.

- Snowmobile Qualified Instructor. Snowmobile-qualified instructors shall complete a snowmobile instructor training program, that meets the requirements of paragraph 4.12.4.c, “Initial Snowmobile,” above.
- Snowmobile Operator. Snowmobile operators shall complete a snowmobile operator training program that meets the requirements of paragraph 4.12.4.c above. A qualified instructor will conduct an evaluation of each operator's performance once every 3 years.
- Snowcat Qualified Instructor. Snowcat qualified instructors shall complete a snowcat instructor training program that meets the requirements of paragraph 4.12.4.d, “Initial Snowcat,” above.
- Snowcat Operator. Snowcat operators shall complete a snowcat training program that meets the requirements of paragraph 4.12.4.d above.
- Burden Carriers/Tow Tractors/Tool Carts Qualified Instructor. Qualified instructors must present a course that meets the requirements of paragraph 4.12.4.e, “Initial Burden Carriers/Tow Tractors/Tool Carts,” above.
- Burden Carriers/Tow Tractors/Tool Carts Certified Operator. Operators shall complete a training program that meets the requirements of paragraph 4.12.4.e above.

g. Proficiency Qualification and Requalification

Specialty use equipment training shall follow the manufacturers’ requirements for safe proficient operation. A qualified instructor will conduct an evaluation of each operator's performance at least once every 3 years on all specialty use equipment.

h. Lack of Proficiency

The supervisor or affected personnel shall immediately stop an operator who demonstrates a lack of proficiency when operating specialty use equipment. Employees shall receive refresher training anytime any Reclamation personnel observes an operator using specialty use equipment in an unsafe manner, evaluation shows lack of proficiency, conditions in the workplace have changed that could affect safe operation, or the operator is assigned to a different type of equipment.

i. Recordkeeping

- Training Documentation. The training provider shall document initial training on all specialty use equipment to include the name of the training organization, if one is used; instructors name and signature; operator’s name; date of the training; the make, model, and configuration of the specialty use equipment used in the evaluation; certification documentation; and any attachments included in the training. This RSHS includes Appendix 4.12-A, Operator Training Documentation Form, for use as training documentation. If the training provider uses another tool to document training, it shall capture the required information listed in this paragraph.
- Records. Reclamation shall keep records in the Department of the Interior's approved repository and manage records in accordance with the Information Management

Handbook as referenced in Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Pre-job Briefing and Post-job JHA Review

The first-line supervisor shall include all employees involved in a project in the pre-job briefing and planning requirements prior to starting work. The first-line supervisor and the relevant employees shall plan and review the JHA to ensure the written JHA includes appropriate procedures for job tasks. All team members involved in the task must perform a post-job review within 7 days of job completion. This can be an informal review conducted after completing the work, except when an activity resulted in a near miss, an injury, or damage to a facility. Refer to RSHS Section 1.04, Work Safety Planning.

6. Hazardous Environmental Conditions (Weather/Other)

Operators shall not operate specialty use equipment when hazardous environmental conditions (weather/other) will not allow for the safe operation of the equipment.

7. Personal Protective Equipment (PPE)

Operators shall wear appropriate Reclamation-provided PPE while operating specialty use equipment per the manufacturer's requirement and JHA.

8. Other Safety Equipment

Any additional safety equipment used during the operation of specialty use equipment must not impede or restrict the operation of the original safety equipment installed by the manufacturer.

9. Safe Practices

a. Speeds

Operators will not operate specialty use equipment above posted speed limits or at speeds greater than those reasonable and safe considering weather conditions, traffic, road conditions, type and condition of equipment, and manufacturer's recommendations. Operators must always maintain control of the equipment and be able to stop within the clear-sight distance.

b. Loading and Unloading an ATV/UTV/Snowmobiles

There are two methods of transporting an ATV/UTV/Snowmobile: towing on a trailer or transporting in a truck bed. Reclamation prefers transporting ATV/UTV/Snowmobiles with a trailer as trailers normally have built-in ramps and are set lower to the ground (see paragraph 4.12.9.e, "Trailering"). Loading and unloading an ATV/UTV/Snowmobiles in a truck bed is a hazardous operation and employees should only use this method if there is no other option available.

- Recommended Measures for Loading ATV/UTV/Snowmobiles into Pickup Trucks.
    - Operators will use one piece-, bi-, or tri-fold ramps that are strapped, chained, bolted to the truck bed.
    - If using 2 individual ramps, the ramps shall be a minimum of 10 inches wide and 72 inches long, positioned to assure that the manufacturer's maximum slope for operation of the ATV/UTV/Snowmobile is not exceeded. Operators must use chains or straps to secure the ramps to the vehicle and prevent rearward movement of the ramps during loading.

- Ramp Loading Criteria.
    - Operators must use ramps manufactured specifically for the use of loading and unloading specialty use of equipment.
    - Operators must use ramps made of aluminum or steel and must be of welded construction. A driving surface must have closely spaced crossed members or mesh construction with high traction surface. Operators may not use wooden ramps.
    - Operators may use either one or two piece-ramps with factory-installed hinges.
    - The weight capacity of the ramp(s) must meet or exceed the weight of the ATV/UTV/Snowmobile and any additional equipment and contents (i.e., filled water tanks) that have been added.

c. Towing

Operators will not exceed the maximum towing capacity, specified by the manufacturer in the operator's manual.

d. Unauthorized Riding

Operators shall not allow employees to ride in, or on, specialty use equipment unless they are sitting in a seat designed and installed for that purpose by the manufacturer and the operator has been trained to safely operate the equipment with a passenger.

e. Trailering

Qualified personnel shall ensure that the trailer used to transport specialty use equipment is rated to safely handle the weight of the equipment and its attachments. Qualified personnel shall properly distribute, chock, tie down, or otherwise secure every piece of specialty use equipment on the trailer. Operators must also secure tools and material during transport and keep stored items and personnel in separated locations. Only qualified trailer operators may tow a trailer per RSHS 4.13, Towable Trailer Safety.

f. Hauling Cargo

All specialty use equipment used to haul cargo shall not exceed the weight capacities specified by the manufacture. ATVs may only haul liquid cargo up to a maximum of 15 gallons on the rear

cargo rack. Operators must properly secure cargo with devices rated for the weight of the hauled cargo.

g. Seats and Seatbelts

Operators shall not allow passengers to ride in, or on, specialty use equipment unless they are seated with the installed seatbelts fastened. This excludes equipment not equipped with a belt-type restraint system like two-person snowmobiles. All operators and/or employees must use the provided restraint system if one is available.

h. Emergency Equipment

First-line supervisors shall provide operators of specialty use equipment with emergency equipment per the operator's manual and JHA.

i. Wheel Chocks

Operators shall use 2-wheel chocks for each vehicle or trailer where there is a possibility that the vehicle will move or shift because of roadway conditions or loading/unloading of the vehicle or trailer, as required in 29 CFR 1910.178(k)(1), mechanical means to secure trucks.

j. Fire Extinguishers

Operators shall ensure fire extinguishers are available on specialty use equipment and ensure they are in a serviceable condition.

k. Audible Alarms

Operators shall ensure that factory installed audible alarms on all Reclamation-owned bi-directional specialty use equipment and rental equipment always remain operable and audible.

l. Horns

Operators shall ensure that specialty use equipment horns are distinguishable from the surrounding noise level. The operator shall ensure that the horn is operational at the beginning of each shift.

10. Inspection Requirements

a. Initial Inspection

A trained operator or maintenance technician shall perform an initial safety inspection, per the operator's manual, on all new specialty use equipment before putting it into service to ensure it is safe to operate.

b. Periodic Inspection

The operator must inspect specialty use equipment at the beginning of each work shift per the manufacturer's requirements. This includes, but is not limited to the following safety items:

- service brake,

- parking brake,
- windows,
- tires/tire pressure,
- tracks,
- lights,
- signals,
- warning devices,
- steering mechanism,
- operating controls,
- wipers,
- defrosters,
- first aid kits,
- coupling devices, and
- fire extinguishers.

11. Maintenance Requirements

a. Removal from Service

The operator or maintenance technician must remove specialty use equipment from service whenever the operator or any other Reclamation employee detects an unsafe condition. Operators must tag equipment with a “Do Not Use” tag or similar tag that alerts employees not to use the equipment. No employee may place the unsafe equipment back into service until a certified technician has repaired and tested or inspected the equipment to ensure it is safe to operate.

b. Repair Shutdown

The operator must shut down and secure equipment from any accidental release of hazardous energy (see RSHS Section 1.13, Control of Hazardous Energy, Lockout/Tagout), while making repairs or adjustments unless operation is essential to making the adjustments or repairs. Operators shall use all energy isolation devices during the repair process, if required.

c. Refueling

Refueling is subject to the requirements set forth in the operator’s manual and in RSHS Section 3.01, Standards for Material Handling, Storage, and Disposal.

d. Blocking

Operators shall block or crib equipment or parts suspended or held aloft by cables, hydraulic cylinders, slings, ropes, hoists, jacks, or manufacturer-supplied hazardous energy control devices, or lower the equipment or parts to a supporting surface before permitting employees to work in, under, or between pieces of equipment or parts.

e. Certification of Rollover Protective Structures (ROPS)

First-line supervisors shall verify that the ROPS are certified by one of the following methods:

- manufacturer or PE's written confirmation that the structures meet required design criteria, or
- permanent labels attached to the structure.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Section 4.13 Towable Trailer Safety

1. Scope

This section establishes safety requirements for towable trailer safety at all Reclamation facilities and operations.

2. General Requirements

Qualified personnel must operate towable trailers in compliance with this section, applicable Department of Transportation (DOT) regulations, and Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910 and 29 CFR 1926.

3. Responsibilities

a. Area, Facility, and Powerplant Managers

- Shall ensure that competent personnel inspect all towable trailers as required by this section.
- Shall designate competent personnel as towable trailer instructors.

b. First-Line Supervisors

- Shall ensure that training is provided to employees assigned to operate towable trailers and ensure that employees are proficient and qualified, as required by this section.
- Shall have a process for ensuring only trained and qualified employees operate towable trailers.

c. Employees

- Shall obtain and complete all training and evaluations for all towable trailers the employee is assigned to operate, as required by this section.
- Shall inspect and perform maintenance on all towable trailers, as appropriate and as required by this section.
- Shall meet the DOT licensing requirements for on-highway operations and possess a current commercial driver's license (CDL) where applicable.
- Shall comply with applicable operating instructions, limitations, regulations, and written safety programs and plans.

4. Training Requirements

a. Initial

The initial training program requirements must consist of the following:

- a review of the owner's manual or competent trainer-prepared operational manual/handout based on information from the manufacturer, instructions by lecture, discussions, interactive computer learning, videos, or written material,
- practical, hands-on training that includes demonstrations performed by the trainer, and
- practical hands-on exercises performed by the trainee under direct observation of the trainer. Trainers shall complete a proficiency evaluation of each operator after the training.
- training will be conducted on the type of towable trailer the trainee will operate.

b. Required Towable Trailer Curriculum

All Bureau of Reclamation (BOR) employees who conduct trailer-related activities shall complete, at a minimum, the areas listed below:

- correctly sizing tow trailers to tow vehicles
- gross vehicle weight rating (GVWR) and gross vehicle combined weight rating (GVCWR) calculations.
- matching trailer couplers with hitches on tow vehicles
- ensuring the shank of the hitch ball will handle the load of the trailer
- inspection requirements for towable trailers before use
- properly coupling the tow trailer to the hitch on the tow vehicle
- proper use of safety chains
- required towable trailer lighting (brake lights, turn signals, running lights) and reflector requirements, based on the length of the trailer
- proper connection of breakaway brakes (if the towable trailer is equipped as such)
- synchronizing brake systems between the brake-equipped towable trailer and the tow vehicle
- proper towable trailer loading and unloading
- proper cargo securement methods (tie downs, binders, ratchet binders, load locks, and other methods) for towable trailers and tow vehicles.
- proper driving techniques to consider when pulling a towable trailer
- hands-on driving and backing course with towable trailer and vehicle to demonstrate proficiency.

Note: Employees who have already completed the training outlined above, such as an employee with a current CDL who can produce a copy of the curriculum, are not required to re-accomplish the training.

c. Proficiency Qualification

Towable trailer safety training shall follow the manufacturers' requirements for safe, proficient operation.

d. Lack of Proficiency

Anyone observing an operator who demonstrates a lack of proficiency when operating a towable trailer shall immediately intervene and notify the supervisor or their designee of the situation. Employees shall receive refresher training whenever an operator has been observed using a towable trailer unsafely.

e. Recordkeeping

- Training Documentation. The training provider shall document initial training on all towable trailers to include the name of the training organization if one is used; instructor's name and signature; operator's name; date of the training; the type of towable trailer being used in the evaluation; proficiency of operation; and any attachments included in the training.

    - This RSHS includes Appendix 4.13-A: Operator Training Documentation Form, for use as training documentation. If the training provider uses another tool to document training, it shall capture the required information listed in this paragraph.

- Records. The first-line supervisor shall ensure that all records are kept in the Department of the Interior's approved repository and managed following the Information Management Handbook referenced in the Reclamation Manual Directive and Standard, Information Management (RCD 05-01).

5. Hazardous Environmental Conditions (Weather/Other)

Operators shall not operate towable trailers when hazardous environmental conditions (weather/other) will not allow for the safe operation of the equipment.

6. Personal Protective Equipment (PPE)

Operators shall wear appropriate PPE while utilizing towable trailers per the manufacturer's requirement or the hazard assessment.

7. Other Safety Equipment

Any additional safety equipment used during the operation of towable trailers must not impede or restrict the operation of the original safety equipment installed by the manufacturer.

8. Safe Practices

a. Speeds

Operators will not operate towable trailers above posted speed limits or at speeds greater than those reasonable and safe, considering weather conditions, traffic, road conditions, type and

condition of equipment, and manufacturer's recommendations. Operators must always maintain control of the towable trailer and be able to stop within the clear-sight distance.

b. Attaching and Detaching Trailers

Employees shall not stand or walk between a towable trailer and the towing vehicle, except when hooking or unhooking the trailer or loading/unloading supplies in/out of the tow vehicle. Ensure the tow vehicle is in park with the parking brake set when hooking or unhooking the trailer or loading/unloading supplies in/out of the tow vehicle or trailer.

c. Unattended at Night

Towable trailers left on publicly accessible roadways overnight should comply with the respective elements of the Manual on Traffic Control Devices (MUTCD), 2009 Edition, which is incorporated by reference in 29 CFR 1926.200(g)(2). Where work is in progress off a roadway, equipment shall be delineated by signs, cones, lights, reflectors, or lighted/reflective barricades to identify the location of the equipment.

d. Unauthorized Riding

Operators shall not allow employees to ride in or on towable trailers except for the launching and loading of watercraft.

e. Securing Loads

Trained operators shall ensure that the towable trailer being used is rated to handle the weight of the cargo safely and shall properly distribute, chock, tie-down, or otherwise secure the load. Recheck the load periodically, but at a minimum in the first 50 miles of travel and then again, every three hours or 150 miles, whichever comes first. Road conditions may warrant more frequent inspections.

f. Wheel Chocks

Operators shall use 2-wheel chocks for each vehicle or trailer where there is a possibility that the vehicle will move or shift because of roadway conditions or loading or unloading of the vehicle or trailer.

g. Trailer Lights

Operators shall ensure that all required towable trailer lights are operational and illuminated during travel to increase visibility.

9. Inspection Requirements

a. Initial Inspection

The towable trailer driver shall conduct a pre-trip inspection on the towable trailer and tow vehicle before use, following the operator's manual. Recheck these items periodically during stops on the trip, paying close attention to heat buildup in bearings, brakes, and tires. If no

operator's manual exists for the trailer, use Appendix 4.13-B: Operator's Towing Pre-Trip Safety Inspection Checklist, for your pre-trip inspection form.

b. Annual Inspection

A qualified technician/mechanic trained to a competent level must inspect welds, structural components, and the general towable trailer for safety and serviceability at intervals not exceeding 12 months or sooner if the manufacturer requires a more frequent inspection process. Document trailer inspections on Reclamation Form 7-1776B Maintenance Requirements, Appendix 4.13-C.

c. Removal from Service

The operator or maintenance technician must remove towable trailers from service whenever an unsafe condition is detected. No employee may place the unsafe towable trailer back into service until it has been repaired, tested, or inspected to ensure that the equipment is safe to operate.

d. Repair Shutdown

The operator must shut down and secure towable trailers from any accidental release of hazardous energy (see RSHS Section 1.13, Control of Hazardous Energy, Lockout/Tagout) while making repairs or adjustments unless the operation is essential to making the adjustments or repairs. All energy isolation devices shall be used during the repair process if required.

e. Blocking

The operator or maintenance technician shall block, or crib towable trailer parts suspended or held aloft by cables, hydraulic cylinders, slings, ropes, hoists, jacks, or manufacturer- supplied hazardous energy control devices, or lower the equipment or parts to a supporting surface before permitting employees to work in, under, or between pieces of equipment or parts.

f. Brake Repair

The operator or maintenance technician shall use a vacuum with a high-efficiency particulate air filter to clean asbestos-lined brake assemblies. The operator or maintenance technician shall not use compressed air for cleaning asbestos-lined brake assemblies. Operators shall refer to RSHS Section 2.02, Asbestos, paragraph 2.02.5.(b)(2), Prohibited Work Practices if working on asbestos-lined brake assemblies.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 4.13-A: Operator Training and Proficiency Documentation Form—Towable Trailers

Appendix 4.13 A (Operator Training and Proficiency Documentation Form) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 4.13-B: Operator's Towing Pre-Trip Safety Inspection Checklist

Appendix 4.13-B (Operator's Towing Pre-Trip Safety Inspection Checklist) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

Appendix 4.13-C: 7-1776B—Trailer Annual Preventive Maintenance Checklist

Appendix 4.13-C (Reclamation Form 7-1776B—Trailer Annual Preventive Maintenance Checklist) is available to print at: https://teamssp.bor.doi.net/printanddup/forms/7Forms/7-1776B.pdf.

Section 4.13-A Operator Training and Proficiency Documentation Form—Towable Trailers Training Documentation

Name of Trainer: Training Date:

Training Org. Name: Department:

Name of Operator: Supervisor Name:

Towable Trailer Specifics

Trailer Dimensions: Width/Length/Width	Type of Trailer and Number of Axels
1.	
2.	
3.	
4.	

Training Details

Trailer Type	Description of Training	Ready (R) Not Ready (NR)	Location/Area of Training	Signature of Trainer
1.				
2.				
3.				
4.				

Operating Test and Results (Proficiency): Trainer will describe the operator's proficiency by indicating if the operator is:

- ready to operate towable trailer,
- not ready, more training is required. Indicate what skills the operator needs to work on to reach proficiency (be specific).

Operator Signature: Trainer Signature:

Date: Date:

Appendix 4.13-B Operator's Towing Pre-Trip Safety Inspection Checklist

Date Operator

Until Serial/License Number

Review the following checklist and indicate whether each item is satisfactory (SAT) or unsatisfactory (UNSAT) while including applicable notes. All unsatisfactory issues must be properly addressed before the trailer can be towed.

1. Tow Vehicle

Item	SAT.	UNSAT.	Notes
The tow vehicle has enough power to safely tow the trailer load.	☐	☐	
The tow vehicle has received regular preventative maintenance work.	☐	☐	
The tow vehicle has adequate fuel, battery power, oil, and engine coolant	☐	☐	
The tow vehicle tires are properly inflated and balanced and do no show excessive wear or damage.	☐	☐	
The wheel fasteners (lug nuts) are present, tight, and rust-free.	☐	☐	
Wheel rims are free from damage.	☐	☐	
Tow vehicle is level when attached to the loaded trailer.	☐	☐	
All lights (dash lights, headlights, taillights, clearance lights, brake lights, directional signals, hazard lights, high beams, reflectors) are in proper working order.	☐	☐	
All brakes are in proper working order.	☐	☐	
Side view mirrors provide an unobstructed rear view on both sides of vehicle.	☐	☐	

2. Hitching Apparatus

Item	SAT.	UNSAT.	Notes
The receiver is properly mounted at the tow vehicle.	☐	☐	
The receiver, drawbar, hitch ball, coupler, sway control device, spring bars, safety chains, and power connection wiring are all functional and compatible with the tow vehicle and trailer.	☐	☐	
The power and brake control connections between the trailer and tow vehicle are compatible, provide enough slack for turning, and are in good working order.	☐	☐	
The landing gear (trailer jack) is functional.	☐	☐	
The hitch ball and coupler are the same size. When attached, the ball is firmly seated in the coupler, and the latching mechanism is locked. Ensure the shank of the ball is compatible with the hitch and rated for the weight of the trailer you will be towing.	☐	☐	
The safety chains are securely attached to both the tow vehicle and trailer, crossing under the trailer tongue in an “x” pattern.	☐	☐	
The safety chains connect the trailer and tow vehicle while providing enough slack for turning.	☐	☐	
The eyelets holding the safety chains all have their open-ended hooks facing the outside of the hitch connection.	☐	☐	
If using a fifth-wheel trailer hitch, the following equipment is in good working order: fifth-wheel plate, plate jaw and handle, hitch plate, pin and pin box, and side rails.	☐	☐	

3. Trailer

Item	SAT.	UNSAT.	Notes
The trailer frame is free of cracks, fractures, bends, and other signs of weakness.	☐	☐	

	SAT.	UNSAT.	Notes
All lights (taillights, clearance lights, brake lights, directional signals, hazard lights, reflectors) are in proper working order.	☐	☐	
The trailer tires are properly inflated and balanced and do not show excessive wear or damage.	☐	☐	
The trailer wheel fasteners (lug nuts) are present, tight, and rust-free.	☐	☐	
Trailer wheel rims are free from damage.	☐	☐	
Loaded trailer is level when attached to the tow vehicle.	☐	☐	
Running boards (if present) are in good condition.	☐	☐	
Winch (if present) is in working order.	☐	☐	

4. Load Distribution

Item	SAT.	UNSAT.	Notes
The trailer load has a center of gravity that is as low as possible, and there is no risk of loose items falling off the trailer.	☐	☐	
Taken separately, the towing vehicle and trailer have even weight distributions (front to rear, left to right). This has been verified by visual inspection and/or scale measurements.	☐	☐	
The trailer weight and its distribution are compatible with the tow vehicle and hitching system, as verified by conducting a vehicle-trailer compatibly check.	☐	☐	

5. Inspection Notes/Issues Found/Remedial Action Taken

Appendix A Definitions

The following definitions apply to this and other documents related to the Reclamation Safety and Health Standards, unless specifically stated in this section

1. Definitions

Term	Definitions	RSHS Section
acceptable entry conditions	The conditions that must exist in a permit-required confined space to allow entry and to ensure that employees can safely enter and work within the space.	1.12
accident	An unplanned event or series of events resulting in injury, occupational illness, or damage to, or loss of, equipment or property to a lesser degree than defined as a serious accident.	1.22
accident investigation	The methodical collection of evidence, and the analysis and interpretation of evidence. The fundamental purpose is to identify the cause(s) of the accident and to recommend corrective actions to prevent or minimize the chance of a reoccurrence.	1.22
accident prevention tags	Shall be used as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc.	1.08
acclimatization	Temporary adaptation of the body to work in the heat or cold that occurs gradually with exposure. Acclimatization peaks in most people within 4 to 14 days of regular work for at least 2 hours per day in the heat.	2.04
accredited organization	An officially recognized group qualified to perform a particular activity. In the context of the Reclamation Safety and Health Standards, accredited organizations shall be formally recognized by the Occupational Safety and Health Administration (e.g., the National Center for Construction Education and Research, and the National Commission for the Certification of Crane Operators).	3.03/3.04
action level	A concentration designated in Federal OSHA 29 CFR part 1910 for a specific substance, calculated as an 8-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.	2.06 / 2.01

Term	Definitions	RSHS Section
administrative controls	Strategies designed to protect workers from hazardous conditions by changing the behavior of workers rather than removing the actual hazard. For example: training, operating procedures, policies, or shift designs that lessen the threat of a hazard to an individual. Similar to PPE, administrative controls are frequently used with existing processes where hazards are not particularly well controlled.	4.08
advanced exterior firefighting	Offensive firefighting performed outside of an enclosed structure when the fire is beyond the incipient stage.	1.09
aerial lifts (device)	Any vehicle-mounted device, telescoping and/or articulating, which is used to position personnel.	1.11
air dose	A dose measured by an appropriately calibrated instrument in air at or near the body surface in the region of the highest dosage rate.	2.05
air-purifying respirator (APR)	A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.	2.08
alert systems	Alarms or procedures designed to warn of existing or imminent emergency situations.	1.06
alternate entry	A permit-required confined space in which the potential or actual atmospheric hazards can be eliminated prior to entry or can be controlled with continuous mechanical forced-air ventilation or reliable natural ventilation.	1.12
anchorage	A secure point of attachment for equipment such as lifelines, lanyards, or deceleration devices.	1.14
angle of loading	The inclination of a leg or branch of a sling measured from the horizontal or vertical plane, provided that an angle of loading of 5 degrees or less from the vertical may be considered a vertical angle of loading.	3.02
approach boundaries	A distance from an exposed live part within which there is an increased risk of shock due to electrical arc over combined with inadvertent movement for personnel working near the live part. For more detail, refer to Reclamation Manual Section FIST 5-14.	1.10

Term	Definitions	RSHS Section
arc-rated (AR) clothing	A form of personal protective equipment designed to protect against arc flashes. AR clothing must meet the requirements of ASTM F1506 and have the appropriate Arc Thermal Protective Value or Energy Breakopen Threshold rating (in cal/cm2) listed on the label.	1.10
articulating boom platform	An aerial device with two or more hinged boom sections.	1.11
as free as practicable	The requirement is met when the employer is vigilant in efforts to ensure surfaces are free of accumulations of lead-containing dust. https://www.osha.gov/laws-regs/standardinterpretations/2003-01-13-1	2.03
asbestos	Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this section, “asbestos” includes presumed asbestos containing material.	2.02
asbestos-containing material (ACM)	Any material containing more than 1 percent asbestos.	2.02
asbestos work	Work operations include demolition or salvage of structures where asbestos is present; removal or encapsulation of materials containing asbestos; construction, alteration, repair, maintenance, or renovation of structures or substrates containing asbestos; installation of products containing asbestos; asbestos spill/emergency cleanup; and transportation, disposal, storage, containment of housekeeping activities involving asbestos.	2.02
assessment	A comprehensive review of facility compliance with the Life Safety Code and other applicable codes.	1.18
assigned protection factor (APF)	The workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuous, effective respiratory protection program.	2.08
atmosphere-supplying respirator (ASR)	A respirator with a source of breathing air independent of the ambient atmosphere, including supplied-air respirators and self-contained breathing apparatus units.	2.08

Term	Definitions	RSHS Section
attendant	An individual stationed outside the permit-required confined space that monitors the authorized entrants and performs other duties, as assigned, to maintain the safety of entrants.	1.12
audiogram	A chart, graph, or table resulting from an audiometric test that shows an individual's hearing threshold levels as a function of frequency. The test exposes an individual to various pure tones at different frequencies to determine the lowest audible level at each frequency.	2.07
augmented accident investigation	An in-depth investigation conducted for accidents or incidents/near misses with the potential to be serious accidents.	1.22
authority having jurisdiction (AHJ)	NFPA 101 (2018) 3.2.2 defines AHJ as, "An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure." A single AHJ is designated from each region.	1.09/ 1.18
Authority Having Jurisdiction Team (AHJT)	A Reclamation team that oversees and advises on application of the Life Safety Code and is comprised of the authority having jurisdiction for each region, an AHJT facilitator from the Safety and Occupational Health Office, and representatives from the Technical Service Center.	1.18
Authority Having Jurisdiction Team Facilitator	The safety engineer from the Safety and Occupational Health Office who chairs, coordinates, and facilitates the Authority Having Jurisdiction Team meetings.	1.18
authorized entrant	An employee who is authorized by permit to enter a permit-required confined space.	1.12
authorized user	An employee authorized by the Radiation Safety Officer to possess and use radiation devices/equipment and has completed training required for the licensed device/equipment.	2.05
a-weighting	A measurement scale that approximates the loudness of tones relative to a reference tone. A-weighting correlates with annoyance measures and is most responsive to the middle frequencies, approximately 500 to 4000 hertz.	2.07
barricades	An obstruction to deter the passage of persons or vehicles.	1.08

Term	Definitions	RSHS Section
baseline audiogram	The audiogram against which future audiograms are compared to determine changes in hearing threshold levels.	2.07
basket hitch	A sling configuration in which the sling is passed under the load and has both ends, end attachments, eyes, or handles on the hook or a single master link.	3.02
bearers	Horizontal transverse scaffold members (which may be supported by ledgers or runners) upon which the scaffold platform rests, and which joins scaffold uprights, posts, poles, and similar members.	1.11
benching	Method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels. Benching cannot be done in Type C soil.	4.01
blood	Human blood, human blood components, and products made from human blood.	2.09
bloodborne pathogens (BBP)	Pathogenic microorganisms present in human blood which cause disease in humans (e.g., human immuno-deficiency virus, hepatitis B).	2.09
Board of Survey	A team appointed, in writing, by the accountable property officer to investigate loss of government property, complete a report of survey documenting the investigation, arrive at findings, and make determinations about the disposition of the property and financial liability for the loss.	1.22
boatswain's chair	A single-point adjustable suspension scaffold consisting of a seat or sling designed to support one employee in a sitting position.	1.11
body belt	A strap with means both for securing about the waist and for attaching to other components, such as a lanyard, and used with positioning systems, travel restraint systems, or ladder safety systems.	1.14
body harness	Straps that support an employee in a manner that distributes fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, and that include a means for attaching the harness to other components of a personal fall protection system.	1.14

Term	Definitions	RSHS Section
buy quiet	A process that attempts to reduce employee exposure to noise emissions by considering noise in the early phases of design and/or when repairing, replacing, and/or acquiring new equipment, machinery, tools, etc.	2.07
carabiner	A connector generally comprising a trapezoidal- or oval-shaped body with a closed gate or similar arrangement that may be opened to attach to another object and that, when released, automatically closes to retain the object.	1.14
cardiopulmonary resuscitation (CPR)	A lifesaving technique useful in many emergencies, including a heart attack or near drowning, in which someone's breathing or heartbeat has stopped.	1.05
cartridge/canister	A container with a filter, sorbent, catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.	2.08
cause	An event, situation, or condition (deficiency) which if corrected, eliminated, or avoided, would likely have prevented or mitigated the mishap, damage, or significant injury. Cause does not imply blame.	1.22
caution	Indicates a hazardous situation that, if not avoided, has the potential to cause a minor or moderate injury.	1.08
certification	An independent verification of a certain level of expertise in a particular area.	1.02
chemical	Any substance or mixture of substances.	1.19
chemical hygiene officer	An employee, selected by their first-line supervisor, that is qualified, by training or experience, to provide technical guidance in the development and implementation of the provisions of the chemical hygiene plan.	2.01
chemical hygiene plan	A written program stating policies, procedures, and responsibilities to protect employees from the health hazards associated with the hazardous chemicals used in their work area.	2.01
chemical inventory	The names of all hazardous chemicals used in the workplace by using the identity that is referenced on the Safety Data Sheet. This identity is often a common name, such as the product or trade name.	1.19
chemical manufacturer	A workplace where chemicals are produced for use or distribution.	1.19

Term	Definitions	RSHS Section
chemical name	The scientific designation of a chemical or a name that will clearly identify the chemical for the purpose of conducting a hazard classification.	1.19
chilblains	Painful inflammation of small blood vessels in the skin that occur in response to repeated exposure to cold, but nonfreezing temperatures. Small blood vessels in the skin may become permanently damaged by cold temperatures resulting in redness and itching during additional exposures.	2.04
Class I asbestos work	Activities involving the removal of thermal system insulation and surfacing asbestos-containing material and presumed asbestos-containing material.	2.02
Class II asbestos work	Activities involving the removal of asbestos-containing material which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.	2.02
Class III asbestos work	Work involving repair and maintenance operations, where asbestos-containing material, including thermal system insulation and surfacing asbestos-containing material and presumed asbestos-containing material, is likely to be disturbed.	2.02
Class IV asbestos work	Maintenance and custodial activities during which employees contact but do not disturb asbestos-containing material or presumed asbestos-containing material, and activities to clean up dust, waste, and debris resulting from Class I, II, and III activities.	2.02
classification	To identify the relevant data regarding the hazards of a chemical, review the data to ascertain the hazards associated with the chemical, and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical in this program. Classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.	1.19

Term	Definitions	RSHS Section
clean agent	Volatile or gaseous fire extinguishant that is electrically nonconducting and that does not leave a residue upon evaporation.	1.09
coating	An elastomer or other suitable material applied to a sling, or to a sling component, to impart desirable properties.	3.02
Code of Federal Regulations (CFR)	The codification of the general and permanent rules and regulations (sometimes called administrative law) published in the *Federal Register* by the executive departments and agencies of the Federal Government of the United States. The CFR is divided into 50 titles that represent broad areas subject to Federal regulation.	1.01
cohesive soil	Clay-type soil (fine grained soil), or soil with a high clay content, which has the property of sticking together tightly and does not crumble. Cohesive soil is hard to break up when dry and exhibits significant cohering unity when submerged.	4.01
collateral duty safety representatives (CDSR)	An assistant to managers, supervisors, and safety and occupational health managers in implementing the Reclamation Occupational Safety and Health Program at the facilities to which they are assigned. While CDSRs are generally not trained safety and occupational health professionals, such professionals coach them.	1.23/1.24
commercial diver	A diver for hire who performs work tasks underwater or any diving operation that involves construction, demolition, repair, maintenance, search, underwater inspections, placing and removing heavy objects, or other similar tasks.	4.07
commercial driver's license (CDL)	A license issued to an individual by a State or other jurisdiction of domicile, in accordance with the standards contained in this section, which authorizes the individual to operate a class of a commercial motor vehicle.	1.21
commercial motor vehicle (CMV)	A motor vehicle or combination of motor vehicles used in commerce to transport passengers or property as defined by the Federal Motor Carriers Safety Administration.	1.21
common name	Any designation or identification such as code name, code number, trade name, brand name, or generic name used to identify a chemical other than by its chemical name.	1.19

Term	Definitions	RSHS Section
competent climber	A person with the physical capabilities to climb, actual tower climbing experience, and training in fall protection regulations and requirements, including the equipment that applies to tower work. A competent climber can identify existing and potential hazards and has the employer's authority to take corrective action to eliminate those hazards.	4.08
competent person	One who can identify health and safety hazards in the workplace and has the authority to correct them.	3.01 / 1.11 / 1.14 /3.03 / 4.01 / 4.05 / 4.08 /2.02 / 2.03
competent rescuer	A competent climber who is designated by the employer and who, by training, knowledge, and experience, is capable of implementing, supervising, and monitoring a rescue at height in the event of an emergency. This person shall have the employer's authority to write the individual site rescue plan and may be designated to manage the employer's fall protection rescue program.	4.08
compressed gas	Any non-flammable material or mixture having a pressure exceeding 41 pounds per square inch absolute (2.8 bar) at 70º F (21º C) or any flammable or poisonous material in gaseous form at 70º F (21º C) and has a pressure of 14.7 pounds per square inch absolute (1 bar) or greater.	1.15
concrete conveyance systems	Mechanical devices used to move concrete from the receiving hopper of the delivery system to the point of use (e.g., pumps, tremies, conveyor belts, hoses).	4.04
confined space	A space that is sized and configured to allow an employee to bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy.	1.12
connector	A device used to couple (connect) parts of the fall protection system together.	1.14/4.05
construction work	Work that involves "construction, alteration, and/or repair, including painting and decorating" (See OSHA 1910.12(b) and OSHA 1926.10(a)).	3.03

Term	Definitions	RSHS Section
construction work activities	Work for construction, alteration, and/or repair, including demolition or salvage of structures where lead is present; removal or encapsulation of materials containing lead; new construction, substrates, or portions or materials which contain lead; installation of products containing lead; lead contamination/emergency cleanup, transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and maintenance operations associated with construction activities.	2.03
contact plan	A written plan that outlines contact information and procedures for the lone or remote worker(s), their supervisor, and appropriate manager(s).	1.17
container	Any can, bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this program, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.	3.01 / 1.19
contaminated	The presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.	2.09
contaminated sharps	Any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.	2.09
continuous noise	Noise where any intervals between impulses are less than 0.5 second.	2.07
control measures	A system, device, or action that controls or prevents the introduction of physical hazards into the confined space.	1.12
corrosives	Materials that can attack and chemically destroy exposed body tissues. Corrosives can also damage or even destroy metal. They begin to cause damage as soon as they touch the skin, eyes, respiratory tract, digestive tract, or metal. They might be hazardous in other ways too, depending on the particular corrosive material.	1.19
critical lift	Hoisting or lifting operations that are known to have increased risks to personnel or property.	3.03/3.04

Term	Definitions	RSHS Section
cut and cover	A tunnel construction method involving the excavation of a trench, the construction of a tunnel, and then returning the surface to its original state.	4.02
danger	Indicates a hazardous situation that, if not avoided, will result in serious injury or death.	1.08
deceleration device	Any mechanism that serves to dissipate energy during a fall.	1.14
deceleration distance	The vertical distance a falling employee travels from the point at which the deceleration device begins to operate, excluding lifeline elongation and free fall distance, until stopping. It is measured as the distance between the location of an employee's body harness attachment point at the moment the deceleration device activates during a fall (i.e., at the onset of fall arrest forces) and the location of that attachment point after the employee comes to a full stop.	1.14
decibel (dB)	A standard unit of measurement of sound pressure level.	2.07
decibel, A-weighted (dBA)	A relative unit of measurement of sound level that approximates the loudness of tones relative to a reference tone. See also: *A-weighting*.	2.07
Departmental Manual (DM)	The record of Department-wide policies and procedures for the Department of the Interior. It contains long-term policies, mandatory procedures, and descriptions of major organization components, as well as selected Secretary's Orders from 1992 to the present.	1.01
designated person	A person who is trained identified by the facility manager to complete daily, shift, and periodic equipment inspections.	3.02
determination memorandum	AHJ's documentation of a decision to apply an exemption, exception, modification, equivalency, mitigations, non-compliance, and code application modification.	1.18
deviation	A document that allows an operation to vary from the standards listed in this manual. A deviation creates a safe workplace in an alternative but approved way.	1.02

Term	Definitions	RSHS Section
disturb	Activities that disrupt the matrix of asbestos-containing material or presumed asbestos-containing material, crumble or pulverize those materials, or generate visible debris from those materials. In no event shall the amount of disturbed asbestos-containing material or presumed asbestos-containing material exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.	2.02
dive hazard analysis	Written document that contains emergency information and phone/cell numbers, planned depths and no-decompression limits, mode of diving, altitude and altitude depth corrections, environmental conditions, currents, visibility, temperature, natural or man-made hazards, activities that could interfere with the dive or pose safety hazards to the dive team, and an analysis of required hazardous energy control at the facility, as appropriate.	4.07
dive plan	In accordance with OSHA 1910.421, the plan shall contain operational objectives, dive site description, diving mode selection, surface and underwater conditions and hazards, air supply requirements, thermal protection, diving equipment and systems, required support equipment, dive team assignments and responsibilities, no-decompression limits, emergency procedures, evacuation procedures, and recompression treatment procedures.	4.07
dive site	The physical location of a diver during a dive. A dive site may be on the surface or underwater.	4.07
diver	Refers to all diving employees including journeyman divers, divers, standby divers, lead divers, and dive supervisors who participate in diving activities or are exposed to hyperbaric conditions.	4.07
diving mode	A type of diving requiring specific equipment, procedures, and techniques (e.g., SCUBA, surface-supplied air, or mixed gas). Mode I: Open Circuit SCUBA, Mode II: SCUBA-Tethered, and Mode III: Surface Supplied Air.	4.07
dose	The amount of actual exposure relative to the amount of allowable exposure. A 100 percent or greater dose represents an exposure that is hazardous.	2.07 / 2.05

Term	Definitions	RSHS Section
dredging	The operation of excavating material from a water environment.	4.11
d-ring	A connector used in a harness as an integral attachment element or fall arrest attachment, in a lanyard, energy absorber, lifeline, or anchorage connector as an integral connector, or in a positioning or travel restraint system as an attachment element.	1.14
dry soil	Soil that does not exhibit any visible signs of moisture content.	4.01
electromagnetic energy	A form of energy that is reflected or emitted from objects in the form of electrical and magnetic waves that travel through space. Examples are radio waves, microwaves, infrared radiation, visible light (all colors of the spectrum that we see), ultraviolet light, X-rays, and gamma radiation.	4.08
electromagnetic radiation	Restricted to the radio frequency spectrum, which for the purpose of this specification shall include the microwave frequency region.	2.05
emergency	Any occurrence or event internal or external to the permit-required confined space (including any failure of control measures or monitoring equipment) that could endanger entrants.	1.12
emergency responder	A designated responder for emergencies such as a law enforcement officer or an emergency medical technician.	1.21
emergency response or responding to emergencies	A response effort by employees from outside the immediate release area or by other designated responders (e.g., mutual aid groups, local fire departments) to an occurrence which results, or likely will result, in an uncontrolled release of a hazardous substance.	1.16
emergency services response plan	A written plan that describes the availability and capability of first responders, outlines the critical information needed by first responders, and states the procedures the supervisor will follow to contact emergency services.	1.17
employee exposure	Exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.	2.02

Term	Definitions	RSHS Section
end of service life indicator (ESLI)	A system that warns the respirator user of the approach of the end of adequate respiratory protection (e.g., that the sorbent is approaching saturation or is no longer effective).	2.08
energy density	Amount of energy stored in a given mass of a substance, system, or region of space per unit volume.	2.05
engineered lift	A noncritical lift that management has designated as requiring additional controls by having a qualified individual or engineer independently pre-identify load weight, load center of gravity, lift attachment points, and minimum lifting hardware (slings, below-the-hook lifting devices, shackles, etc.) capacities that will be used for the lift or series of lifts. Pre-identified information shall be provided to the personnel involved in the lift.	3.03/3.04
engineering controls	Strategies designed to protect workers from hazardous conditions by placing a barrier between the worker and the hazard. Examples include local exhaust ventilation to capture and remove airborne emissions or machine guards to shield workers.	4.08 / 2.09
engulfment	The surrounding and/or effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated and cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.	1.12
entry	The action by which a person has significantly exposed themselves to the hazards of the space or passes through an opening to a permit-required confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the permit-required confined space.	1.12
entry permit (Permit)	The written or printed document that allows and controls entry into a permit space. The permit is granted by the employer and contains information such as the type of space to be entered, the purpose of entry, the names of entrants, etc.	1.12

Term	Definitions	RSHS Section
entry supervisor	The person responsible for (1) determining if acceptable entry conditions are present at a permit space where entry is planned, (2) authorizing entry and overseeing entry operations, and (3) terminating entry when prohibited conditions develop.	1.12
Environmental Management System (EMS)	A standardized planning, implementing, measuring, and reporting processes targeted to increase management control, decrease liability, and foster continuous improvement. It is a management practice that allows Reclamation to strategically address its environmental impacts.	1.02
environmental risk factors for heat illness	Working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.	2.04
equivalent	Alternative designs, equipment, materials, or methods that the employer can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials, or methods specified in the standard.	1.14
excavation	Any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. Simple excavations are typically less than 5 feet deep, and trenches are deeper excavations that go to 20 feet deep.	4.01
excavation planner	A person who is either an engineer or equivalent competent person with sufficient experience and knowledge of excavation work and planning. The excavation planner creates the Excavation Work Plan and oversees inspections at the excavation site.	4.01
excavation work plan	The work details to be conducted at an excavation site.	4.01

Term	Definitions	RSHS Section
exchange rate	The added or subtracted increment of decibels that requires halving or doubling the exposure time, respectively. For example, a 3-decibel exchange rate requires that noise exposure time be halved for each 3-decibel increase in noise level; likewise, a 5-decibel exchange rate requires that exposure time be halved for each 5-decibel increase.	2.07
Executive Order (EO)	A rule or order issued by the President to an executive branch of the Government and having the force of law.	1.01
exposure assessment	A process that determines the magnitude of the dose, toxicity, duration, and the route of entry of potential exposures and their health threat.	2.06
exposure Incident	Specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials during the performance of an employee's duties.	2.09
exposure limit	An 8-hour time-weighted average of 85 decibels measured on the A-scale and in slow response mode, and an exchange rate of 3 decibels.	2.07
exposure or exposed	An employee is subjected during employment to a chemical that is a physical or health hazard and includes potential accidental or possible exposure. "Subjected," in terms of health hazards, includes any route of entry (e.g., inhalation, ingestion, skin contact, absorption).	1.19
extensible boom platform	An aerial device (except ladders) with a telescopic or extensible boom. Telescopic derricks with personnel platform attachments shall be considered extensible boom platforms when used with a personnel platform.	1.11
fabric (metal mesh)	The flexible portion of a metal mesh sling consisting of a series of transverse coils and cross rods.	3.02
fatigue	Mental and/or physical exhaustion that reduces an employee's ability to perform their work safely and effectively.	1.04

Term	Definitions	RSHS Section
fatigue management plan (FMP)	A documented approach to ensure management, supervisory personnel, and employees understand what fatigue is, how extended hours of work or consecutive days of work can affect fatigue, and proper proactive methods of effectively dealing with worker fatigue. An effective FMP will include awareness of and response to fatigue issues in the workplace.	1.04
fiber	A particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.	2.02
field-going vehicle	Vehicles with higher ground clearance and 4-wheel drive used for the purpose of driving on rougher and steeper roads and trails.	1.21
filtering facepiece	A negative pressure particulate respirator with a filter that is either an integral part of, or the entirety of, the facepiece (i.e., dust mask).	2.08
final medical determination	A written medical opinion on the employees' health status by the examining physician or, where relevant, the outcome of the multiple physician review mechanism.	2.03
fire brigade	An organized group of employees who are knowledgeable, trained, and skilled in at least basic firefighting operations and whose full-time occupation might, or might not, be the provision of fire suppression and related activities.	1.09
first aid	The assistance given to any person suffering a sudden illness or injury to preserve life, prevent the condition from worsening, or promote recovery.	1.05
first aid kit	A collection of first aid supplies meant to be used to treat minor cuts, abrasions, and burns. Employees must not rely on a first aid kit to handle more severe injuries.	1.05
fissured	Soil material that tends to break along definitive planes of fracture with little resistance, or a material that has open cracks in an exposed surface.	4.01
fit factor	A measurement of the tightness of a respirator's fit. Fit factors are determined by a quantitative respirator fit test conducted during a simulation of workplace activities.	2.08

Term	Definitions	RSHS Section
fit test	A check, or OSHA 29 CFR 1910.134 Appendix B-1 *User Seal Check Procedures (Mandatory)*, that should be performed each time a tight-fitting respirator is put on to ensure there is an adequate seal between the respirator and the user's face.	2.08
fixed ladder	A ladder that cannot be readily moved or carried because it is an integral part of a building or structure.	1.11
flaggers/flagman	A person who has successfully completed the American Traffic Safety Services Association approved flaggers/flagman training in order to follow the safe work practices and requirements to keep motorists and road workers safe during temporary roadwork.	1.08
flashpoint	The minimum temperature of a liquid at which vapor is given off to form an ignitable mixture with the air near the surface of the liquid or within the vessel used, as determined by the appropriate test procedure and apparatus.	1.09
floating pipeline	Any pipeline not anchored on the channel bottom.	4.11
foreseeable emergency	Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.	1.19
formwork	The total system of support for freshly placed or partially cured concrete including the mold or sheathing that contacts the concrete as well as all supporting members, hardware, and bracing.	4.04
free fall	The act of falling before the personal fall arrest system begins to apply force to arrest the fall.	1.14
free fall distance	The vertical displacement of the fall arrest attachment points on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance and lifeline and lanyard elongation but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before the devices operate and fall arrest forces occur.	1.14
frostbite	Freezing of the skin and tissues. Frostbite can cause permanent damage to the body and, in severe cases, can lead to amputation.	2.04

Term	Definitions	RSHS Section
generally licensed device	Consists of radioactive material contained in a sealed source within a shielded device, such as gas chromatograph units, fixed gauging devices, static eliminators, luminous exit signs, calibration or reference standards, some ice detection devices, and in vitro laboratory kits. The device is designed with inherent radiation safety features so that it can be used by persons with no radiation training or experience. The general license simplifies the licensing process so that a case-by-case determination of the adequacy of the radiation training or experience of each user is not necessary. The Nuclear Regulatory Commission evaluates the adequacy of these generally licensed products, ensuring that distributors meet the specific requirements in 10 CFR Part 32 Subpart B and that users meet the requirements in 10 CFR Part 31.	2.05
Globally Harmonized System of Classification and Labeling of Chemicals (GHS)	Program developed and used by the United Nations to allow for a uniformity-oriented approach for the classification and presentation of hazard information through labeling and safety data sheets.	1.19
granular soil	Soil material comprised of mainly gravel, sand, or silt (coarse-grained soil) with little to no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit false cohesion but cannot be molded and will crumble when dry.	4.01
green cutting	Roughening of concrete surface by using high-pressure water cutting equipment. Typically done for impermeable construction joints where material joint systems are not possible to use.	4.04
ground-fault circuit interrupter (GFCI)	A type of circuit breaker that shuts off electrical power when it senses an imbalance between the outgoing and incoming current.	1.10
guardrail system	A barrier erected along an unprotected or exposed side, edge, or other area of a walking-working surface to prevent employees from falling to a lower level.	1.11
guy anchor	A structure that attaches a guy-wire to the ground.	4.08
guy wire	A tensioned cable designed to add stability to a free-standing structure.	4.08

Term	Definitions	RSHS Section
handrail	A rail used to provide employees with a handhold for support.	1.11
hazard	Anything that potentially endangers personnel, impedes safe working conditions, and could result in injury or loss of life.	4.08
hazard assessment	A thorough check of the work environment. The purpose of a hazard assessment is to identify potential risks and hazards in the area as well as appropriate safety measures to be used to mitigate the identified hazards.	1.04
hazard category	The division of criteria within each hazard class (e.g., oral acute toxicity and flammable liquids) include four hazard categories. These categories compare hazard severity within a hazard class and should not be taken as a comparison of hazard categories more generally.	1.19
hazard class	The nature of the physical or health hazards (e.g., flammable solid, carcinogen, oral acute toxicity).	1.19
hazard not otherwise classified (HNOC)	An adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in OSHA 29 CFR 1910.1200. This does not extend coverage to adverse physical and health effects for which there is a hazard classified addressed in OSHA 29 CFR 1910.1200, but the effect either falls below the cut-off value/concentration limit of the hazard class or is under a Globally Harmonized System of Classification and Labelling of Chemicals hazard category that has not been adopted by OSHA.	1.19
hazard statement	A statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.	1.19
hazardous atmosphere	An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness.	1.12 / 1.15 / 4.01
hazardous chemical	Any chemical classified as a physical or health hazard, or a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified.	1.16 / 1.19 / 2.01

Term	Definitions	RSHS Section
hazardous energy	Any energy source that may cause injury or death. Any energy, including mechanical (e.g., power transmission apparatus, counterbalances, springs, pressure, gravity), pneumatic, hydraulic, electrical, chemical, nuclear, and thermal (e.g., high or low temperature) energy that could cause injury to employees. Danger is only present when energy may be released in quantities or at rates that could injure employees. Hazardous chemical energy, for the purposes of this standard, includes chemicals (e.g., flammable and combustible liquids, flammable gases, acids, and alkaline chemicals) that may thermally produce burn injury through high or low temperature, or are sufficient enough to displace oxygen and incapacitate employees	1.13
hazardous material	Any substance or chemical which is a health hazard or physical hazard. This includes chemicals such as carcinogens; irritants; corrosives; toxic agents; sensitizers; agents that damage the lungs, skin, eyes, or mucous membranes; chemicals that can combust, explode, or are flammable; oxidizers; pyrophorics; or are unstable-reactive or water-reactive.	2.06
hazardous substance	Any substance defined by 42 U.S.C. Chapter 103, *Comprehensive Environmental Response, Compensation, and Liability*, Section 9601 (14) or any substance listed by the Department of Transportation as a hazardous material. Additionally, any biologic agent or other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction), or physical deformations in such persons or their offspring.	1.16
hazardous waste	Those substances defined as hazardous wastes in 40 CFR 262.11 and 49 CFR 171.8.	1.16

Term	Definitions	RSHS Section
health hazard	A chemical classified as posing one of the following hazardous effects: acute toxicity (any route of exposure), skin corrosion or irritation, serious eye damage or eye irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicity, specific target organ toxicity (single or repeated exposure), or aspiration hazard (OSHA 29 CFR 1910.1200, Appendix A, *Health Hazard Criteria (Mandatory)*).	2.06 / 1.16 / 1.19 / 2.01
health hazard assessment	An evaluation used to systematically identify and evaluate health hazards, evaluate proposed hazardous materials, and propose measures to eliminate or control these hazards through engineering design changes or protective measures and thereby reduce the risk to a level acceptable to Reclamation.	1.04 / 2.06
hearing protection devices (HPDs)	Any device or material that is capable of being worn and reduces the level of sound entering the ear.	2.07
heat cramps	A heat-related illness characterized by spastic contractions of the voluntary muscles (mainly arms, hands, legs, and feet), usually associated with restricted salt intake and profuse sweating without significant body dehydration.	2.04
heat exhaustion	A heat-related illness characterized by elevation of core body temperature above 100.4 degrees Fahrenheit and abnormal performance of one or more organ systems, without injury to the central nervous system. Heat exhaustion may signal impending heat stroke.	2.04
heat illness	A serious medical condition resulting from the body's inability to cope with a particular heat load and includes heat cramps, heat exhaustion, heat syncope, and heat stroke.	2.04
heat stroke	An acute medical emergency caused by exposure to heat from an excessive rise in body temperature above 106 degrees Fahrenheit and failure of the temperature-regulating mechanism. Injury occurs to the central nervous system characterized by a sudden and sustained loss of consciousness preceded by vertigo, nausea, headache, cerebral dysfunction, bizarre behavior, and excessive body temperature.	2.04

Term	Definitions	RSHS Section
hepatitis	A bloodborne viral disease that has an incubation period of 2 weeks to 5 months, depending on the type. Hepatitis results in inflammation of the liver in varying severity. Hepatitis is transmitted through fecal contamination or ingested material, skin penetration by infected objects (needles), injection of contaminated blood or blood by-products, and contamination of mucous membranes (eyes, mouth). There are three types of Hepatitis—A, B, and C. Hepatitis A (HAV) is excreted in the feces and is generally introduced to the body via the oral route. Hepatitis B (HBV) is contained in the blood and other body fluids. It is transmitted by exposure to blood or body fluids through the mucous membranes, non-intact skin, and directly into the blood stream (parenteral route). Hepatitis C (HCV) is also contained in blood but is mainly transmitted through a blood transfusion.	2.09
hierarchy of controls	A system used to minimize or eliminate hazards by classifying hazard controls according to effectiveness and prioritizing those controls that best limit the worker's exposure to the hazard.	1.07 / 2.02
High Efficiency Particulate Air (HEPA) filter	A filter capable of trapping and retaining at least 99.97 percent of mono-dispersed, airborne particles with an aerodynamic diameter of 0.3 microns in diameter, or larger.	2.02 / 2.03
high radiation area	An area accessible to employees, where radiation is at levels, that a major portion of the body could receive in any 1-hour a dose more than 100 millirems.	2.05
hitch	A sling configuration in which the sling is fastened to an object or load, either directly to it or around it.	3.02
hoisting equipment	Commercially manufactured lifting equipment designed to lift and position a load of known weight to a location at a known elevation and horizontal distance from the equipment's center of rotation. Includes, but is not limited to, cranes, derricks, tower cranes, barge-mounted derricks or cranes, gin poles, and gantry hoist systems.	4.05
hot work	Welding, cutting, brazing, riveting, arc-gouging, grinding, and all other processes which may produce a flame or spark as a byproduct or secondary effect of its use.	1.15

Term	Definitions	RSHS Section
hot work permit	A written process document specific to each hot work job outlining important information, duties, and safety precautions to reduce the potential of ignition in hot work areas.	1.15
human immuno-deficiency virus (HIV)	A virus that attacks cells which help the body fight infection, making a person more vulnerable to other infections and diseases.	2.09
hypothermia	Occurs when the normal body temperature (98.6 degrees Fahrenheit) drops to less than 95 degrees Fahrenheit. Exposure to cold temperatures causes the body to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Hypothermia is most likely at very cold temperatures, but it can occur even at cool temperatures (above 40 degrees Fahrenheit) if a person becomes chilled from rain, sweat, or immersion in cold water.	2.04
illness	Any disease contracted primarily as a result of an exposure to risk factors arising from work activity. For recordkeeping purposes, an occupational illness occurs over the span of more than one work shift.	1.22
immediate use	When a chemical will be under the control of, and used only by, the person who transfers it from a labeled container and only within the work shift in which it is transferred.	1.19
immediately dangerous to life or health (IDLH)	Any condition that poses an immediate threat to life, which would cause irreversible adverse health effects, or that would interfere with an employee's ability to escape unaided from a permit space. NOTE: Some materials may produce immediate transient effects that, even if severe, pass without medical attention but are followed by sudden, possibly fatal collapse from 12 to 72 hours after exposure. The victim feels normal after recovering from the transient effects until collapse. Such materials in hazardous quantities are immediately dangerous to life or health.	1.12 / 1.16 / 2.08
impact noise	Noise produced by a single mass colliding with a second mass generally less than one second in duration that repeats no more than once per second.	2.07

Term	Definitions	RSHS Section
impulse noise	Noise usually considered to be single noise pulses less than one second in duration, or a series of repetitive noise pulses that may last longer than one second in duration.	2.07
incident/near miss	An unplanned event which could have resulted in an injury, illness, or material loss, but did not. If there is injury, illness, or loss of property, the incident/near miss is reported as an accident.	1.22
incipient-stage fire	A fire in the initial or beginning stage that can be controlled or extinguished by portable fire extinguishers, Class II standpipes, or small hose systems without the need for protective clothing or breathing apparatus.	1.09
individual horizon span	The distance between vertical members.	4.04
infrared radiation	Electromagnetic radiation with wavelengths longer than those of visible light and is invisible to the human eye.	2.05
injury	Any wound or damage to the body resulting from an event in the work environment. For recordkeeping purposes, an injury occurs within a single work shift.	1.22
inspection	A physical examination of facility compliance with the Life Safety Code and other applicable codes conducted in conjunction with other Reclamation inspections.	1.18
Inspection and Abatement System (IAS)	The required agency system of record to document all facility safety inspections, findings, and abatement progress.	1.23
interior structural firefighting	Fire suppression, rescue, or both, inside of buildings and enclosed structures experiencing a fire beyond the incipient stage.	1.09
investigation	A fact-finding and analysis process designed to identify cause and prevent future accidents and control hazards from occurring.	1.03
ionizing radiation	The most energetic form of radiation, capable of removing electrons from atoms (ionization) and damaging the DNA within living cells. X-rays, gamma rays, and alpha and beta particles are examples of ionizing radiation.	2.05

Term	Definitions	RSHS Section
isolated work	Work conducted outside normal work hours or on-site areas where coworkers, public individuals, or other agency individuals are not in the vicinity to respond in an emergency or otherwise assist within 15 minutes.	1.05
isolation	The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.	1.12
job hazard analysis (JHA)	A documentation technique that focuses on job tasks to identify hazards before they occur. JHAs focus on the relationship between the worker, the task, the tools, and the work environment.	1.04 / 1.07 / 1.08 / 2.08 / 1.17
kill switch or dead man switch	A device designed to shut off the engine if the operator is thrown overboard or otherwise away from the watercraft controls.	4.11
label	An appropriate group of written, printed, or graphic information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.	1.19
label elements	The specified pictogram, hazard statement, signal word, and precautionary statement for each hazard class and category.	1.19
laboratory	A facility where the "laboratory use of hazardous chemicals" occurs. A workplace where small quantities of hazardous chemicals are used on a non-production basis.	2.01
laboratory scale	Working with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.	1.19 / 2.01

Term	Definitions	RSHS Section
laboratory use	Handling or use of such chemicals in which all of the following conditions are met: (1) chemical manipulations are carried out on a "laboratory scale," (2) multiple chemical procedures or chemicals are used, (3) the procedures involved are not part of a production process, nor in any way simulate a production process and (4) "protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.	1.19
ladder safety system	A system designed to eliminate or reduce the possibility of falling from a ladder. A ladder safety system usually consists of a carrier, a safety sleeve, a lanyard, connectors, and a body harness. Cages and wells are not ladder safety systems.	1.11
ladder-jack scaffolds	A supported scaffold consisting of a platform resting on brackets attached to ladders.	1.11
lanyard	A strap or flexible line of rope or wire rope that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.	1.14
layered system	Two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered systems.	4.01
lead	Metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.	2.03
ledger	The lengthwise horizontal spacing or bracing member, which may support the bearers.	1.11
Life Safety Code (LSC)	NFPA 101, or the Life Safety Code is a consensus standard widely adopted in the United States. The LSC is administered, trademarked, copyrighted, and published by the NFPA and, like many NFPA documents, is systematically revised on a 3-year cycle.	1.18

Term	Definitions	RSHS Section
lifeline	A component of a personal fall protection system consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline) or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline) and that serves as a means for connecting other components of the system to the anchorage.	1.14
light duty vehicle	A vehicle with a gross vehicle weight rating of less than 8,500 pounds for Department-owned vehicles, or less than 12,500 pounds for GSA-leased vehicles.	1.21
limited emergency services response	A response time that is greater than non-remote locations for emergency services and/or first responders that poses an elevated risk to the employee(s).	1.17
link	A single ring of a chain.	3.02
lone worker	An employee working alone in any location, except an assigned duty station, a teleworking site, or while in travel status utilizing commercial transportation. Lone workers include employees traveling alone in remote locations.	1.17
lower explosive limit	The minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source.	3.01 / 1.12
machine guarding	A safety feature on or around machinery. It consists of a shield, cover, or other device to prevent contact with body parts, catching loose clothing items, or flying chips/sparks.	1.15
maintenance activities	Activities keeping a structure, fixture, or foundation in proper condition in a routine, scheduled, or anticipated fashion. Refer to OSHA's letter of interpretation https://www.osha.gov/laws-regs/standardinterpretations/2003-11-18.	2.03

Term	Definitions	RSHS Section
maintenance work (general industry)	Making or keeping a structure, fixture, or foundation (substrates) in proper condition in a routine, scheduled, or anticipated fashion. This work only goes so far as to keep equipment in its existing state, to prevent failure and decline. Maintenance work is small scale and simple, routine, and done on a regularly scheduled/periodic basis to help maintain the original condition of the component. If the extent of these work activities is larger or more complex, it is no longer maintenance work.	3.03
major message	Portion of a tag inscription more specific than a signal word and that indicates specific hazardous conditions or the instruction to be communicated to the employee. Examples include: “High Voltage,” “Close Clearance,” “Do Not Start,” “Do Not Use,” or a corresponding pictograph used with a written text or alone.	1.08
maximum allowable slope	The steepest incline of an excavation face that is acceptable for the most favorable site conditions. The maximum allowable slope is expressed as a ratio of horizontal distance to vertical rise (H:V).	4.01
maximum intended load	The total load of all persons, equipment, tools, materials, transmitted loads, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.	1.11
means of egress	A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge.	1.09
medical removal protection benefits	The protections afforded to a continuing vacancy after an employee has been medically removed or limited, including: the total normal earnings, seniority, employment rights, benefits, and the right to the former job status as though the employee had not been medically removed or otherwise medically limited.	2.03
medical/infectious wastes	All waste emanating from human or animal tissues, blood or blood products, or fluids. This includes used first aid bandages, syringes, needles, sharps, material used in spill cleanup, and contaminated personal protective equipment or clothing.	2.09

Term	Definitions	RSHS Section
medium or heavy-duty vehicle	A medium duty vehicle has a gross vehicle weight rating of 8501-16,000 pounds for Department-owned vehicles, or 12,501-23,999 pounds for GSA-leased vehicles. A heavy-duty vehicle has a gross vehicle weight rating of more than 16,000 pounds for Department-owned vehicles, or more than 24,000 pounds for GSA-leased vehicles.	1.21
mixture	Any combination or a solution composed of two or more substances in which they do not react.	1.19
mobile crane	A lifting device incorporating a cable suspended lattices boom or hydraulic telescope boom designed to be moved between operating locations by transport over the road.	3.04
mode	Means of exposure.	1.12
motor vehicle	A vehicle that is self-propelled, has two or more pneumatic, hydraulic tires, and is designed primarily for transportation of personnel or material. Motorized equipment shall be classified as a motor vehicle if it meets the minimum requirements identified above, is not designated as a military motor vehicle, and is not covered by 41 CFR 102.34.	1.21
motorboat	Any motorized watercraft 65 feet, or less, in length and does not require a U.S. Coast Guard license or certification to operate.	4.11
multiple lift rigging	A rigging assembly manufactured by wire rope rigging suppliers which facilitates the attachment of up to five independent loads to the hoist rigging of a crane.	4.05
negative pressure respirator	A respirator in which the air pressure inside the facepiece during inhalation is lower than the ambient air pressure outside the respirator.	2.08
noise dosimeter	The monitoring equipment used to determine the actual employee noise dose. The data from the dosimeter indicate the integrated time-weighted average noise dose for the monitored worker. A dosimeter must be American National Standards Institute-approved and is worn by the employee throughout the work shift.	2.07

Term	Definitions	RSHS Section
noise induced hearing loss (NIHL)	A hearing loss originating in the inner ear or sensory organ (cochlea and associated structures) or the vestibulocochlear nerve (cranial nerve VIII) that is attributed to noise and for which no other etiology can be determined.	2.07
noise reduction rating (NRR)	A single-number rating that attempts to describe a hearing protector according to how much it reduces the overall noise level. The NRR theoretically provides an estimate of the protection that should be met, or exceeded, by 98 percent of the wearers of a given device.	2.07
nonionizing radiation	A series of energy waves composed of oscillating electric and magnetic fields traveling at the speed of light including the spectrum of ultraviolet, visible light, infrared, microwave, radio frequency, and extremely low frequency.	2.05
non-permit required confined space	A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazards capable of causing death or serious physical harm.	1.12
nonserious accident	An unplanned event or series of events that results in injury, occupational illness, or damage to or loss of equipment or property to a lesser degree than as defined for a serious accident.	1.03
normal operations	Operating programs, activities, and equipment as designed for non-emergency settings.	1.06
objective data	Information demonstrating a product or material containing lead or a specific process, operation, or activity involving lead cannot release dust or fumes in concentrations at or above the allowable level under any expected conditions of use.	2.03
occupant emergency plan	A set of procedures to protect life and property in Federally occupied space under defined emergency conditions.	1.06
occupational Exposure	Any reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials which may result from the performance of an employee's duties.	2.09
occupied	A facility occupied by people on a regular basis.	1.18

Term	Definitions	RSHS Section
official government business	An employee's paid tour of duty while conducting agency mission-oriented business (e.g., operating a Government-owned, GSA-leased, or rental vehicle during normal or temporary duty; or operating a privately-owned vehicle while conducting job tasks).	1.21
official use	Using a motor vehicle to perform the agency's mission(s), as authorized by the agency.	1.21
operator(s)	Non-Reclamation employees who work on Reclamation-owned facilities but are not operated by Reclamation. *or* The individual in physical control of the watercraft or dredge. *or* Any individual who operates a Department-owned, GSA-leased, rental, or privately-owned motor vehicle in the performance of official duties. *or* A person who operates equipment that they have been trained, evaluated, and authorized to operate and can provide documentation of their training and/or forklift certification.	1.02 4.11 1.21 3.05
o-ring	A gasket in the form of a ring with a circular cross section, typically made of pliable material, used to seal connection in pipes and tubes.	1.14
other potentially infectious materials (OPIM)	Includes synovial fluid, cerebrospinal fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, semen, vaginal secretions, saliva in dental procedures, any body fluids visibly contaminated with blood such as saliva or vomit, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids such as in an emergency response.	2.09
out of service (impairment)	A condition where a fire protection system, unit, or portion thereof is out of order and therefore may not function in a fire event	1.09
presumed asbestos containing material (PACM)	Thermal system insulation and surfacing material found in buildings constructed no later than 1980.	2.02

Term	Definitions	RSHS Section
parenteral contact	Piercing of mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, or abrasions.	2.09
partial body radiation	Pertains to which part of the body is exposed to electromagnetic energy during an incident.	2.05
pathogen	A bacterium, virus, or other microorganism that can cause disease.	2.09
percutaneous	Made, done, or effected through the skin.	2.09
permissible exposure limit	A concentration designated in Federal OSHA 29 CFR part 1910, for a specific substance, calculated as an 8-hour time-weighted average that is the maximum upper exposure legal limit to a hazardous substance exposure that an employee can be exposed to in an 8-hour period.	2.06 / 1.12 / 2.08 / 2.01
permit system	The facility's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.	1.12
permit-required confined space (PRCS)	A confined space that has one or more of the following characteristics and therefore requires entrants to be authorized by permit: contains, or has potential to contain, a hazardous atmosphere, contains a material that has the potential for engulfing an entrant, has an internal configuration that could cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section, and/or contains any other serious safety or health hazard (chemical, thermal, animal, mechanical, etc.).	1.12
personal fall arrest system	A system used to stop an employee in a fall from a walking-working surface. It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.	1.11 / 1.14
personal fall protection system	A system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.	1.14

Term	Definitions	RSHS Section
personal floatation device (PFD)	Commonly known as a life jacket. Various types of PFDs are available. The type of PFD selected depends on user activity, weather conditions, and user preference.	4.11
personal protective equipment (PPE)	Clothing, headwear, eyewear, footwear, or other garments or equipment designed to protect the wearer's body from injury or infection. PPE is provided to employees by Reclamation; it is not part of the ordinary and usual clothing (e.g., long pants, warm clothing in winter, etc.) an employee may reasonably be expected to provide for himself or herself. The Occupational Safety and Health Administration defines PPE as equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.	Throughout
personnel monitoring equipment	Devices designed, worn, or carried by an individual for the purpose of measuring the dose received (e.g., film badges, pocket chambers, pocket dosimeters, film rings).	2.05
physical hazard	A chemical classified as posing one of the following hazardous effects: explosive, flammable (gases, aerosols, liquids, or solids), oxidizer (liquid, solid, or gas), self-reactive, pyrophoric (liquid or solid), self-heating, organic peroxide, corrosive to metal, gas under pressure, or, when in contact with water, emits flammable gas (OSHA 29 CFR 1910.1200, Appendix B, *Physical Criteria (Mandatory)*).	1.19 / 2.01
physician or other licensed health care professional (PLHCP)	An individual whose legally permitted scope of practice (e.g., license, registration, or certification) allows them to independently provide, or be delegated the responsibility to provide, some or all required health care services.	2.08

Term	Definitions	RSHS Section
pictogram	A composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under 29 CFR 1910.1200 for application to a hazard category.	1.19
portable ladder	A ladder that can be readily moved or carried.	1.11
portable tank	A closed container with a capacity over 60 gallons that is not intended for fixed installation.	3.01
positioning system (work-positioning system)	A system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or windowsill, and work with both hands free. Positioning systems are also called positioning system devices and work-positioning equipment.	1.14
powder-actuated tool	A fastening tool actuated by explosives or any similar means, that propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object.	1.15
power density	The power per unit area in a radiated microwave field or other type of electromagnetic field.	2.05
powered air purifying respirator (PAPR)	An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.	2.08
precautionary statement	A phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling.	1.19
pressure vessel	A tank or cylinder vessel designed to operate at pressures above 15 pounds per square inch gauge sig (e.g., external air receivers and internal air receivers in oil separators, compressed air systems, governor tanks, boilers).	1.15
preventative maintenance	Routine scheduled maintenance of motor vehicles including inspections, tune-ups, oil changes, filter changes, verification and replenishment of fluids, lubrication, alignments, tire wear, and pressure checks.	1.21

Term	Definitions	RSHS Section
product identifier	Name or number used for a hazardous chemical on a label or in the Safety Data Sheet. It provides a unique means by which the user can identify the chemical. The product identifier used shall permit cross-references to be made among the list of hazardous chemicals required in the written hazard communication program, the label, and the Safety Data Sheet.	1.19
program coordinator	A person that has the appropriate training and/or experience to manage, coordinate, implement, and evaluate specific program elements and/or materials handling, storage, and disposal requirements.	3.01 / 1.12 / 4.08 / 2.07 / 2.08 / 1.19
prohibited condition	Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.	1.12
project lead	Designated by the first-line supervisor to oversee work on the job site.	4.04
project manager	The Reclamation employee with direct authority and responsibility for management of the project.	4.02
proof load	The load applied when performing a proof test.	3.02
proof test	A nondestructive tension test performed by the sling manufacturer, or an equivalent entity, to verify construction and workmanship of a sling.	3.02
qualified climber	A person that has completed a Tower Climber and Rescue Competent Person training, completed cardiopulmonary resuscitation and first aid training, and passed the medical standards examination outlined and described in Tab 12, Attachment D 10 of 485 DM 18, *Occupational Medicine Program Handbook*.	4.08
qualified person	One, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems related to the subject matter, the work, or the project.	1.10 / 1.11 / 1.14 / 3.02 / 3.03 / 3.04 / 4.05 / 4.11
qualified Personnel/ Trainer	A person who has the documented training, knowledge, experience, and certifications (if required) to perform the task they are being asked to complete.	3.05
quantitative fit test (QNFT)	An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.	2.08

Term	Definitions	RSHS Section
radiation area	An area accessible to employees where radiation is at levels that a major portion of the body could receive in any 1 hour, a dose more than 5 millirem, or in any 5 consecutive days, a dose more than 100 millirems.	2.05
radiation sources	Radioactive materials or devices that produce ionizing radiation (e.g., byproduct materials and X-ray producing devices).	2.05
radio frequency	The oscillation rate of an alternating electric current or voltage or of a magnetic, electric, electromagnetic field, or mechanical system in the frequency range from around 20,000 times per second (20 kilohertz) to around 300 billion times per second (300 gigahertz). This is roughly between the upper limit of audio frequencies and the lower limit of infrared frequencies. These are the frequencies at which energy from an oscillating current can radiate off a conductor into space as radio waves. Different sources specify different upper and lower bounds for the frequency range.	4.08
radioactive material	Any material which emits, by spontaneous nuclear disintegration, ionizing radiation in the form of particulate or electromagnetic emanations.	2.05
radiofrequency	Radiation which includes radio waves and microwaves, is at the low-energy end of the electromagnetic spectrum, and is a type of non-ionizing radiation. Visible light is another type of non-ionizing radiation.	2.05
rated capacity	The maximum working load permitted (also called the working load limit).	3.02
rated load	The manufacturer's specified maximum load to be lifted by a hoist or to be applied to a scaffold or scaffold component.	1.11
raveling	Movement of individual particles of soil in shallow troughs on the veneer of the soil.	4.01
recordable hearing loss	When an employee’s hearing test (audiogram) reveals that the employee has experienced a work-related standard threshold shift in one or both ears, and the employee’s total hearing level is 25 decibels or more above audiometric zero (averaged at frequencies 2000, 3000, and 4000 hertz) in the same ear(s) as the standard threshold shift .	2.07

Term	Definitions	RSHS Section
registered professional engineer (PE)	A person registered as a professional engineer in the state where the work is performed. Reclamation allows a registered PE from any State to approve designs of manufactured protective systems or tabulated data when used in interstate commerce.	4.01
regulated waste	Liquid or semi-liquid blood, other potentially infectious materials, or contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.	2.09
rem	Measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of 1 roentgen (r) of X-rays (1 millirem (mrem)=0.001 rem). The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions for irradiation.	2.05
remote location	A normally unoccupied location where employees conduct work, with limited to non-existent two-way communications, and is not an assigned duty station.	1.17
remote work	Work conducted in areas geographically separated from the employee's duty station and in which communications with coworkers and an emergency response time would exceed 15 minutes because of travel constraints.	1.05
remote worker	One or more employees working or traveling in a remote location (see: remote work). Remote workers do not include teleworking employees at a remote assigned duty station.	1.17
rental vehicle	A motor vehicle contractual agreement for use between the government and a third-party entity for a period of time and for a fee.	1.21

Term	Definitions	RSHS Section
repair	Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of asbestos-containing material or presumed asbestos-containing material attached to structures or substrates.	2.02
repetitive dive	Defined specifically as a dive 10 minutes after surfacing and in less than 12 hours. A repetitive dive is another dive occurring before the diver can completely off gas from the first or subsequent dive.	4.07
rescue services	The personnel designated to rescue employees from permit spaces.	1.12
respirator user	A user that has been medically qualified to use a respirator, has successfully completed respiratory protection training, and has been properly fit tested.	2.08
respiratory protection	Controls used to reduce or eliminate the hazards associated with air contaminated by harmful dusts, fogs, fumes, mists, gasses, smokes, sprays, vapors, or other hazardous particulates in the air.	4.01
rest	A period of time during which the person concerned is off duty; not performing work, including administrative tasks; and afforded the opportunity for uninterrupted sleep. Rest does not include time for breaks, meals, or travel to/from work.	1.04
restrictive area	Any area access-controlled by the employer for the purposes of protection of individuals from exposure to radiation or radioactive materials.	2.05
retrieval system	The equipment (including a retrieval line, chest or full-body harness and/or wristlet, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.	1.12
risk assessment	A thorough review of the potential risks of lone or remote work, that includes measures to mitigate identified risks associated with the planned lone or remote work.	1.17
Risk Assessment Code (RAC)	A hazard number ranking system from 1 (the highest level of risk) to 5 (the lowest level of risk).	1.23
risk factor	Behavior, environment, or work conditions that potentially increases the probability of an incident occurring or severity of an incident.	2.06

Term	Definitions	RSHS Section
runners	The lengthwise horizontal spacing or bracing member of a scaffold that may support the bearers.	1.11
safe climb device	Typically, a fixed rail or tensioned cable with a slider to permit a worker to climb without continually having to hold, push, or pull any part of the system, so both their hands are free for climbing.	4.08
safety briefing	Pre-departure discussion of the vessel, safety gear location, where and where not to sit and/or stand, and the overall guidelines for the boat and trip.	4.11
safety can	An approved container with a capacity of not more than 5 gallons and a spring-closing lid and spout cover that is designed to safely relieve internal pressure when exposed to fire.	3.01
Safety Data Sheet (SDS)	Written or printed material concerning a hazardous chemical that is prepared in accordance with OSHA 29 CFR 1910.1200(g), formerly known as a Material Safety Data Sheet.	1.19
Safety Evaluation (SAFE)	An Excel spreadsheet designed to identify local safety program strengths and opportunities for improvement by outlining a series of questions that were agreed upon by the regional safety managers in collaboration with the Chief, Safety and Occupational Health Office. The questions in the SAFE checklist are in alignment with the 2010 Department of Interior Handbook, *Guide to the Completion of the Safety and Occupational Health Program Evaluation Tool.*	1.20
safety factor	The ratio of the ultimate breaking strength of a member or piece of material or equipment to the actual working stress or safe load when in use.	1.11 / 1.14
Safety Management Information System (SMIS)	A collection of computer programs that assist safety managers and Department employees in managing the safety risks associated with employment in the Department. Additionally, SMIS serves as a conduit for employees injured on the job to file claims for compensation and enables compensation coordinators to track, review, and monitor the workers' compensation program.	1.02 / 1.23

Term	Definitions	RSHS Section
satellite emergency notification device (SEND)	A device that utilizes satellite communications, can send and receive emergency messages, and transmits an emergency locator signal.	1.17
subcutaneous diving apparatus (SCUBA) diving	A diving mode independent of surface supply in which the diver is a free swimmer using a self-contained underwater breathing apparatus, breathing from a supply of air (gas) carried by the diver.	4.07
secondary container	When a chemical is transferred from its original container to another container, the container transferred into is called a secondary container.	1.19
select carcinogen	Any substance meeting the following criteria: regulated by Federal OSHA as a carcinogen: listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program latest edition; listed under Group 1, "carcinogenic to humans," by the International Agency for Research on Cancer Monographs latest editions; and listed in either Group 2A or 2B by the International Agency for Research on Cancer or under the category, "reasonably anticipated to be carcinogens" by the National Toxicology Program, and causes statistically significant tumor incidence in experimental animals if after inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m3, after repeated skin application of less than 300 (mg/kg of body weight) per week, or after oral dosages of less than 50 mg/kg of body weight per day.	2.01
self-contained breathing apparatus (SCBA)	An atmosphere-supplying respirator with a breathing air source designed to be carried by the user.	2.08
self-retracting lifeline/ lanyard	A deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.	1.14

Term	Definitions	RSHS Section
serious accident	An unplanned event or series of events that results in death, injury, occupational illness, or damage to or loss of equipment or property and involves 1 or more fatalities, 3 or more personnel who are inpatient hospitalized for other than observation, and/or property or equipment damage of $250,000 or more.	1.03 / 1.22
service life	The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.	2.08
severity of use/service	The relative conditions and factors considered in wear and tear on equipment.	3.02
shaft	A vertical, underground passage that is made from the surface of the ground to a point underground, the longer axis of which makes an angle greater than 20 degrees to the horizontal; a pit in which there are employees, and it is foreseeable that they may enter or do enter the horizontal excavation; or a pit that has typical underground construction hazards and is connected to a horizontal excavation.	4.02
sharps Injury	Any injury caused by a sharp, including, but not limited to, cuts, abrasions, or needlesticks.	2.09
shelter-in-place	Seeking safety within the building one already occupies rather than evacuating the building.	1.06
shielding	A trench box or other complex, walled, protective system used to protect workers in trenching excavations.	4.01
shock loading	When a load is accelerated or decelerated too quickly. Shock loading puts additional strain on rigging system components and (if too severe) can damage or overload the system.	3.02
shoring	Temporary vertical support member in a formwork system, designed to carry the weight of the formwork, concrete, and construction loads.	4.01 / 4.04
short term exposure	A period of time, 24 hours or less, that an excavation is open.	4.01

Term	Definitions	RSHS Section
signal word	A word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used in OSHA 29 CFR 1910.1200(c) are “danger” and “warning.” “Danger” is used for the more severe hazards while “warning” is used for the less severe hazards.	1.08 / 1.19
signals	Moving signs provided by workers such as flagger or by devices such as flashing lights to warn of possible or existing hazards.	1.08
signs (safety signs)	The warning of hazard temporarily or permanently affixed or placed at location where hazard exists.	1.08
site grading	Grading or scraping of soil at depths of 6 inches or less.	4.01
site/facility safety plan	A document that describes the potential hazards of the work site, along with all company policies, controls, and work practices selected to minimize those hazards. The site safety plan is also a tool to communicate the management’s commitment and philosophy towards safety and the annual site safety goals.	1.04
sling	An assembly that connects the load to the material handling equipment.	3.02
sling manufacturer	A person or organization that assembles sling components into their final form.	3.02
sloping	Cutting back the excavation or trench wall at an angle inclined away from the excavation.	4.01
sloughing	Clumps or slabs of soil breaking away from the main soil body and falling off slopes, banks, or vertical cuts.	4.01

Term	Definitions	RSHS Section
snap hook	A connector comprising a hook-shaped body with a normally closed gate or similar arrangement that may be manually opened to permit the hook to receive an object. When released, the snap hook automatically closes to retain the object. Opening a snap hook requires two separate actions. Snap hooks are generally either automatic-locking type (permitted), with a self-closing and self-locking gate that remains closed and locked until intentionally unlocked and opened for connection or disconnection, and in a lanyard, energy absorber, lifeline, or anchorage connector as an integral connector; or non-locking type (prohibited), with a self-closing gate that remains closed, but not locked, until intentionally opened for connection or disconnection.	1.14
Soil Classification System	Method of categorizing soil and rock deposits in a set hierarchy.	4.01
sound level meter	The equipment used for representative area monitoring of sound levels. Sound level meters must be Type II (or better) and must meets American National Standards Institute standards.	2.07
source Individual	Any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.	2.09
spalling	The breaking off of flakes or small clusters of soil from the larger soil mass.	4.01
special condition	An unusual or temporary condition pertaining to equipment or system.	1.08
stable rock	Natural, solid mineral matter that can be excavated with vertical sides and remain intact while exposed.	4.01
stair rail	A barrier erected along the exposed or open side of a stairway to prevent employees from falling to a lower level.	1.11
standard threshold shift (STS)	A change in hearing threshold (relative to the baseline audiogram) of an average of 10 decibel or more and at 2000, 3000, and 4000 hertz in 1 or both ears.	2.07
steel erection	The construction, alteration, or repair of steel buildings, bridges, and other structures, including the installation of metal decking and planking.	4.05

Term	Definitions	RSHS Section
structural steel	A steel, or substitute material (e.g., fiberglass, aluminum, composite), member. These members include, but are not limited to, steel joists, joist girders, purlins, columns, beams, trusses, splices, seats, metal decking, girts, and bridging; and cold formed metal framing integrated with the structural steel framing of a building.	4.05
subject matter expert (SME)	A person with documented education, training, certification, knowledge, or on-the-job experience in interpreting and applying the Life Safety Code or conducting Life Safety Code compliance assessments.	1.18
submerged	Soil located underwater or free seeping.	4.01
substance	Chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.	1.19
supported scaffold	Platforms supported by legs, outrigger beams, brackets, poles, uprights, posts, frames, or similar rigid support.	1.11
surface supplied air diving	Includes those forms of diving where air is supplied from the surface to the diver by a flexible hose.	4.07
surfacing material	Material sprayed, troweled-on, or otherwise applied to surfaces such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes.	2.02
suspension scaffold	One or more platforms suspended from an overhead structure by ropes or other non-rigid means.	1.11
system scaffold	A scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be connected at predetermined levels.	1.11
tabulated data	Tables and charts approved by a professional engineer used to design and construct a protective system.	4.01
tags	Attached to a piece of equipment or part of structure to warn of existing or immediate hazards.	1.08

Term	Definitions	RSHS Section
tank	Any vessel holding more than 60 gallons, intended for fixed installation, and is not a part of a flammable liquids process equipment.	3.01
tank vehicle	A commercial motor vehicle designed to transport any liquid or gaseous materials within a tank, or tanks, with an individual rated capacity of more than 119 gallons and an aggregate rated capacity of 1,000 gallons or more either permanently or temporarily attached to the vehicle or the chassis.	1.21
testing	The process by which the hazards that may confront entrants to a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.	1.12
thermal system insulation (TSI)	Asbestos-containing material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.	2.02
threshold limit value (TLV)	The level of a chemical substance to which an employee can be exposed day after day for a working lifetime without adverse effects. TLV is a reserved term of the American Conference of Government Industrial Hygienists.	2.08
Tier 1 rescue response mode	A type and timing of rescue in which there are no recognized hazards but technical rescue for extraction is required when a worker becomes incapacitated.	1.12
Tier 2 rescue response mode	A type and timing of rescue in which there are non-life-threatening hazards to a worker that require rapid intervention and technical rescue.	1.12
Tier 3 response mode	A type and timing of rescue in which there are life-threatening hazards to a worker that require immediate intervention and technical rescue.	1.12
time-weighted average (TWA)	The average of different exposure levels during an exposure period. For noise, given an 85 decibels A exposure limit and a 3 decibels exchange rate, the TWA is calculated according to the following formula, where D=dose: TWA = 10.0 × Log(D/l00) + 85.	2.07

Term	Definitions	RSHS Section
toxic substance	Any substance that can cause injury or illness, or which is suspected of being able to cause injury or illness under some conditions.	1.19
trade secret	Any confidential formula, pattern, process, device, information, or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it (OSHA 29 CFR 1910.1200 Appendix E, *Definition of "Trade Secret" (Mandatory)*).	1.19
travel restraint (tether) line	A rope or wire rope used to transfer forces from a body support to an anchorage or anchorage connector in a travel restraint system.	1.14
travel restraint system	A combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface	1.14
trench	A narrow excavation, in relation to its length, made below the surface of the ground. Generally, the depth of a trench is greater than its width, but not where the width is greater than 15 feet (measured at the bottom of the trench). A trench shall be no greater than 20 feet deep.	4.01
trench foot	A non-freezing injury of the feet caused by prolonged exposure to wet and cold conditions. It can occur in temperatures as high as 60 degrees Fahrenheit if feet are constantly wet.	2.04
tunnel	An excavation beneath the surface of the ground, the longer axis of which makes an angle not greater than 20 degrees to the horizontal.	4.02
ultraviolet radiation	Portion of the electromagnetic spectrum between x-rays and visible light.	2.05
United States Code (USC)	The official compilation and codification of the general and permanent Federal statutes of the United States containing 53 titles.	1.01
universal precautions	Practice of treating all human blood and certain body fluids as if known to be infectious for human immuno-deficiency virus, Hepatitis B and C, and other bloodborne pathogens.	2.09

Term	Definitions	RSHS Section
unusual equipment configurations	When equipment is used outside the manufacturer's operating requirements as listed in the operation and maintenance manual.	3.05
vertical slip form	A form raised as concrete placed and moved vertically to form walls, bins, or slips.	4.04
warning	Indicates a hazardous situation that, if not avoided, could result in serious injury or death.	1.08
warning tags	Tags used to represent a hazard level between “caution” and “danger” instead of the required caution tag, a signal word of “warning,” and appropriate major message and otherwise meet the general tag criteria.	1.08
watercraft	Boats and ships, collectively, propelled manually, by wind, or machinery (e.g., airboats, sailboats, inflatable rafts, other vessels), excluding seaplanes.	4.11
wet bulb globe thermometer (WBGT)	The WBGT is a measure of the heat stress in direct sunlight, that considers temperature, humidity, wind speed, sun angle, and cloud cover (solar radiation).	2.04
whole body irradiation	Where the entire body is exposed to the incident electromagnetic energy or in which the cross section of the body is smaller than the cross section of the incident radiation beam.	2.05
wind chill	The rate of heat loss from the human body, resulting from the combined effect of low air temperature and wind speed.	2.04
wind velocity	The horizontal direction and speed of air motion.	3.04
work practice controls	A reduction in the likelihood of exposure by altering the way a task is performed (e.g., wearing gloves and/or other personal protective equipment).	2.09
working load limit	See “rated capacity” definition	3.02
x-rays	Penetrating electromagnetic radiation (photons) having a wavelength that is much shorter than that of visible light. These rays are usually produced by excitation of the electron field around certain nuclei.	2.05

2. Acronyms

Acronym	Definition
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	American Concrete Institute
ACM	asbestos-containing material
AGCA	Associated General Contractors of America
AHJ	authority having jurisdiction
AHJT	Authority Having Jurisdiction Team
ANSI	American National Standards Institute
APF	assigned protection factor
API	American Petroleum Institute
APR	air-purifying respirator
AR	arc-rated
ASME	American Society of Mechanical Engineers
ASR	atmosphere-supplying respirator
AWS	American Welding Society
BBP	bloodborne pathogens
CDL	commercial driver's license
CDSR	collateral duty safety representatives
CFR	Code of Federal Regulations
CMV	commercial motor vehicle
CO	contracting officer
COR	contracting officer's representative
CPR	cardiopulmonary resuscitation
dB	decibel
dBA	decibel, A-weighted
DM	Departmental Manual
DOT	Department of Transportation
EMS	Environmental Management System
EMT	Emergency Medical Technician
EO	Executive Order
EPA	Environmental Protection Agency
ESLI	end of service life indicator
FAA	Federal Aviation Administration
FHA	Federal Highway Administration
FMP	fatigue management plan
FOPS	falling object protection structure
FR	flame resistant
GFCI	ground-fault circuit interrupter

Acronym	Definition
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
HEPA	High Efficiency Particulate Air
HEW	health, education, welfare
HHA	health hazard analysis
HIV	human immunodeficiency virus
HNOC	hazard not otherwise classified
HPDs	hearing protection devices
IDLH	immediately dangerous to life or health
IAS	Inspection and Abatement System
JHA	job hazard analysis
LPG or LP-gas	liquefied petroleum gas
LPN	licensed practical nurse
LSC	Life Safety Code
MSHA	Mine Safety and Health Administration
MUTCD	Manual of Uniform Traffic Control Devices
NEC	National Electrical Code
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NIHL	noise induced hearing loss
NIOSH	National Institute for Occupational Safety and Health
NRR	Nuclear Reduction Rating
NRR	noise reduction rating
OPIM	other potentially infectious materials
OSHA	Occupational Safety and Health Administration
PACM	presumed asbestos containing material
PAPR	powered air-purifying respirator
PCSA	Power Crane and Shovel Administration
PE	professional engineer
PEL	permissible exposure limits
PFD	personal flotation device
POL	petroleum, oils, and lubricants
PLHCP	physician or other licensed health care professional
PPE	personal protective equipment
PRCS	permit-required confined space
QNFT	quantitative fit test
RAC	Risk Assessment Code
RF	radio frequency
RN	registered nurse
ROPS	rollover protective structures

Acronym	Definition
SAE	Society of Automotive Engineers
SDS	Safety Data Sheet
SAFE	safety evaluation
SEND	satellite emergency notification device
SCBA	self-contained breathing apparatus
SCUBA	self-contained underwater breathing apparatus
SME	subject matter expert
SMIS	Safety Management Information System
STS	standard threshold shift
TLV	threshold limit value
TSI	thermal system insulation
TWA	time weight average
UL	Underwriters Laboratories
USC	United States Code
USCG	U.S. Coast Guard
WBGT	wet bulb globe thermometer

Appendix B Additional References and Citations

These references apply unless superseded by more current standards.

1. American Concrete Institute

Reference Paragraph	RSHS Section
American Concrete Institute. ACI 318 – AC318 *Building Code Requirements for Structural Concrete*.	25
American Concrete Institute. ACI 347 - *Guide to Formwork for Concrete*.	25

2. American Industrial Hygiene Association

Reference Paragraph	RSHS Section
American Industrial Hygiene Association. *The Occupational Environment — Its Evaluation, Control and Management*. Falls Church, VA: AIHA, 2011.	32

3. American National Standards Institute (ANSI)

Reference Paragraph	RSHS Section
A10.8, Scaffolding Safety Requirements.	13
A10.9-2013 (R2018), Safety Requirements for Concrete and Masonry Work.	25
A10.11, *Safety Requirements for Personnel Nets*	26
A10.13, *Safety Requirements for Steel Erection*	26
A10.14, Construction and Demolition Operations - Requirements for Safety Belts, Harnesses, Lanyards and Lifelines for Construction and Demolition Use.	16
A14.1-.5, Ladders.	13
B30.9, Slings.	18
B30.10, Hooks.	18
B30.20, Below-the-Hook Lifting Devices.	18
B30.26, Rigging Hardware.	18
S3.21-2004 (R2009), *Methods For Manual Pure-Tone Threshold Audiometry*.	31
Z35.1, Specifications for Accident Prevention Signs.	9

Z87.1, Occupational and Educational Personal Eye and Face Protection Devices.	8
Z89.1, Industrial Head Protection.	8
Z136.1, Safe Use of Lasers.	8
Z308.1, Minimum Requirements for Industrial Unit– Type First Aid Kits. ANSI/ISEA Z308.1-2015	5
Z490.1, Safety, Health, and Environmental Training.	16
Z535, Safety Alerting Standards	9
Z535.2, Environmental and Facility Safety Signs	9
Z535.1, Safety Colors.	28
Z359.2, Minimum Requirements for a Comprehensive Managed Fall Protection Program.	16
358.1-2014. Association. *American National Standard for Emergency Eyewash and Shower Equipment*.	33

4. American Society for Testing Materials (ASTM)

Reference Paragraph	RSHS Section
ASTM D1048, Standard Specification for Rubber Insulating Blankets.	8
ASTM D1049, Standard Specification for Rubber Insulating Covers.	8
ASTM D1050, Standard Specification for Rubber Insulating Line Hose.	8
ASTM D178, Standard Specification for Rubber Insulating Matting.	8
ASTM D1051, Standard Specification for Rubber Insulating Sleeves.	8
ASTM D120, Standard Specification for Rubber Insulating Gloves.	8
ASTM F1414, Standard Test Method for Measurement of Cut Resistance to Chainsaw in Lower Body (Legs) Protective Clothing.	8
ASTM F1897, Standard Specification for Leg Protection for Chain Saw Users.	8
ASTM F2413, Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear.	8
ASTM F1506 REV A - *Standard Performance Specification for Flame Resistant and Electric Arc Rated Protective Clothing Worn by Workers Exposed to Flames and Electric Arcs*.	12

5. American Society of Mechanical Engineers

Reference Paragraph	RSHS Section
A13.1, Scheme for Identification of Piping Systems.	9
A120.1 *Safety Requirements for Powered Platforms and Traveling Ladders and Gantries for Building Maintenance*	19B
B30.2 *Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)*	19A/B
B30.3 *Tower Cranes*.	19A
B30.5 *Mobile and Locomotive Crane*	19B
B30.6 *Derricks*	19A
B30.7 *Winches*	19A
B30.8 *Floating Cranes and Floating Derricks*	19B
B30.12 *Handling Loads Suspended from Rotorcrafts*	19B
B30.14 *Side Boom Tractors*	19B
B30.16 *Overhead Underhung and Stationary Hoist*	19A
B30.17 *Cranes and Monorails (With Underhung Trolley or Bridge)*	19A
B30.19 *Cableways*	19A
B30.22 *Articulating Boom Cranes*	19B
HST-6M, *Performance Standard for Air Wire Rope Hoists*.	19A

6. American Society of Safety Professionals (ASSP)

Reference Paragraph	RSHS Section
ASSP A10.22 *Safety Requirements for Rope-Guided and Non-Guided Workers' Hoists*	19B
ASSP A10.5 *Safety Requirements for Material Hoists*	19B

7. United States Army Corps of Engineers

Reference Paragraph	RSHS Section
U.S. Army Corps of Engineers. Safety and Health Requirements. Manual no. EM 385-1-1 (2014).	4

8. Bureau of Land Management

Reference Paragraph	RSHS Section
Bureau of Land Management Handbook Tower Climbing and Fall Protection Program, 1292-1 (2011)/1292-1 I (2016).	30

9. Centers for Disease Control and Prevention

Reference Paragraph	RSHS Section
Centers for Disease Control and Prevention. 42 CFR 84, Respiratory Protective Devices	32
Centers for Disease Control and Prevention. Limiting Heat Burden While Wearing Personal Protective Equipment (PPE).	45
Centers for Disease Control and Prevention. OSHA-NIOSH Heat Safety Tool.	45

10. United States Coast Guard

Reference Paragraph	RSHS Section
Coast Guard, Department of Homeland Security. 46 C.F.R. 25 – Requirements.	28

11. Contract Work Hours and Safety Standards Act (CWHSSA)

Reference Paragraph	RSHS Section
Contract Work Hours and Safety Standards Act (CWHSSA), Public Law 107-217, 116 Stat. 1062, 1304 (2002).	1

12. Department of Agriculture

Reference Paragraph	RSHS Section
Department of Agriculture. Standard for Spark Arresters for Internal Combustion Engines. Forest Service Standard 5100-1d.	10

13. Department of Energy

Reference Paragraph	RSHS Section
US Department of Energy - Hanford Site. Hanford Hoisting and Rigging Manual.	18 / 19B

14. Department of the Interior

Reference Paragraph	RSHS Section
Department Manual, Part 485, Chapter 5, Program Evaluations	38
Department Manual, Part 485, Chapter 6, Inspections and Abatement	41
Department Manual, Part 485, Chapter 7, Incident and Accident Reporting	40
Department Manual, Part 485, Chapter 16, Motor Vehicle Safety.	39
Department Manual, Part 485, Chapter 20, Personal Protective Equipment	8
Department Manual, Part 485, Chapter 22, Watercraft Safety	28
Department Manual, Part 485, Chapter 27, *Underwater Diving Safety*	29
Department Manual, Part 485, Chapter 28, Collateral Duty	42
Department Manual, Part 412 DM, Chapter 1, Motor Vehicle Management	39
Departmental Manual, Part 900, Chapter 41, Emergency Management	6
US Department of the Interior Office of Occupational Safety and Health. Medical Program Handbook (Fifth Edition).	19B
Department Personnel Bulletin NO: 17-15, Drug-Free and Alcohol-Free Workplace Plan. (October 2017)	39
Department Temporary Duty Travel Policy.	39

15. Department of Transportation

Reference Paragraph	RSHS Section
U.S. Department of Transportation Federal Highway Administration. Manual on Uniform Traffic Control Devices (MUTCD).	9
U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Emergency Response Guidebook.	21
Department of Transportation, *Shippers—General Requirements for Shipments and Packaging*	32
U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. 49 C.F.R. 172.101 Appendix A. *List of Hazardous Substances and Reportable Quantities*.	21
Department of Transportation. 49 CFR 178, Specifications for Packaging.	11 / 32
Department of Transportation. 49 CFR 180, *Continuing Qualification and Maintenance of Packaging*	32

16. Environmental Protection Agency

Reference Paragraph	RSHS Section
Environmental Protection Agency. 40 CFR 211, Product Noise Labeling. www.govinfo.gov/app /details/CFR-2002-title40-vol21/CFR-2002-title40-vol21-part211/summary.	8
Environmental Protection Agency. 40 CFR Part 763, Asbestos. Code of Federal Regulations: Chapter 40, Part 763 -- Asbestos (epa.gov)	36

17. European Standards

Reference Paragraph	RSHS Section
European Standard EN 12492, Standard for Mountaineering Helmets. National Fire Protection Association.	8

18. Executive Orders

Reference Paragraph	RSHS Section
Executive Order 12196, Occupational Safety and Health Programs for Federal Employees. https://www.archives.gov/federal-register/codification/executive-order/12196.html.	1

19. Federal Communications Commission

Reference Paragraph	RSHS Section
Federal Communications Commission. 47 CFR 1.1310, Radiofrequency Radiation Exposure Limits, Federal Register no. 78:33650, June 4, 2013.	30
Federal Communications Commission. 47 CFR 17, Construction, Marking, and Lighting of Antenna Structures.	30

20. Federal Occupational Safety and Health Administration (OSHA)

Reference Paragraph	RSHS Section
1910.25, Stairways.	13
1910.28, Duty to have Fall Protection and Falling Object Protection.	13 / 14
1910.29(b)(13)(i) – Fall protection and guardrails-walking, working surfaces.	28
1910.29, Fall Protection and Falling Object Protection and Practice Criteria.	16
1910.38, Emergency Action Plans.	6
1910.95, Occupational Noise Exposure.	31
1910.97, Nonionizing Radiation. 1910.97 - Nonionizing radiation.	46
1910.101, Compressed Gases	17
1910.106 - Flammable Liquids	34
1910.110, Storage and Handling of Liquefied Petroleum Gases.	11
1910.120 Hazardous waste operations and emergency response.	21
1910.134, Respiratory Protection.	32
1910.145, Specifications for accident prevention signs and tags.	9
1910.146, Permit-Required Confined Spaces.	14
1910.146 App A, Permit-Required Confined Space Decision Flow Chart.	14

1910.146 App F, Non-Mandatory Appendix F – Rescue Team or Rescue Service Evaluation Criteria	14
1910.147, The control of hazardous energy (lockout tagout).	15
1910.151, Medical Services and First Aid.	33
1910.176, Subpart N, Materials Handling and Storage.	11
1910.178, Materials Handling and Storage	20
1910.179, Overhead and gantry cranes.	18
1910.184, Slings	18
1910.215, Abrasive wheel machinery	17
1910.243, Guarding of portable powered tools	17
1910.244, Other portable tools and equipment	17
1910.252, Welding, cutting, and brazing	17
1910.268, Telecommunications.	30
1910.269, Electric power generation, transmission, and distribution.	15
1910.333, Selection and use of work practices.	15
1910.410, Qualifications of a Dive Team.	29
1910.420, Safe Practices Manual.	29
1910.421, Pre-Dive Procedures.	29
1910.422, Procedures During a Dive.	29
1910.423, Post-Dive Procedures.	29
1910.424, SCUBA Diving.	29
1910.425, Surface-Supplied Air Diving.	29
1910.430, Equipment.	29
1910.1020, Access to Employee Exposure and Medical Records.	37
1910.1020, Access to Employee Exposure and Medical Records.	31 / 36
1910.1025, Lead.	37
1910.1030 App A Hepatitis B Vaccine Declination (Mandatory).	35
1910.1030, Bloodborne Pathogens.	35
1910.1096, Ionizing Radiation. 1910.1096 - Ionizing radiation.	46
1910.1200 - Hazard Communication.	21 / 33 / 34
1910.1450, Occupational Exposure to hazardous chemicals in laboratories.	33 / 34
1926, Safety and Health Regulations for Construction.	1 / 2
1926 Subpart AA, Confined Spaces in Construction.	14
1926 Subpart CC – Cranes and Derricks in Construction.	19B
1926 Subpart CC. 1926.1411, Power line safety-while traveling under or near power lines with no load.	12
1926 Subpart D, Occupational Health and Environmental Controls.	22
1926 Subpart G, Signs, Signals, and Barricades	9
1926 Subpart L, Appendix A, Scaffold Specifications.	13
1926 Subpart N – Helicopters, Hoists, Elevators, and Conveyors.	19B

1926 Subpart O – Motor Vehicles, Mechanized Equipment, and Marine Operations.	19B
1926, Subpart E, Personal Protective and Lifesaving Equipment.	8
1926.21, Safety Training and Education	20
1926.23, First Aid and Medical Attention.	5
1926.55, Gases, Vapors, Fumes, Dusts, and Mists	23
1926.56, Illumination	23
1926.62, Lead	37
1926.150, Fire Protection	23
1926.200, Accident prevention signs and tags.	9
1926.201, Signaling	9
1926.251, Rigging Equipment for Material Handling.	18
1926.417, Lockout and tagging of circuits.	15
1926.451, Scaffolds General Requirements.	13
1926.454, Training Requirements.	13
1926.502, Fall Protection System Criteria and Practices.	14 / 16
1926.552, Material Hoists, Personnel Hoists, and Elevators	23
1926.601, Motor Vehicles, Mechanized Equipment, and Marine Operations	20
1926.752, Site Layout, Site-Specific Erection Plan and Construction Sequence.	26
1926.753, Hoisting and Rigging.	18 / 19B / 26
1926.754, Structural Steel Assembly.	26
1926.756, Beams and Columns.	26
1926.759, Falling Object Protection.	26
1926.760, Fall Protection.	26
1926.761, Training.	26
1926.800, Underground Construction	23
1926.961, Deenergizing lines and equipment for employee protection.	15
1926.1101, Asbestos.	36
1926.1153 - Respirable crystalline silica.	25
1926.1412, Inspection.	18
1926.1413 Wire rope—inspection.	18
1926.1431, Hoisting Personnel.	13
1960 Subpart J Evaluation of Federal Occupational Safety and Health Programs.	38
1960, Basic Program Elements for Federal Employees.	1
1960.25, Qualifications of Safety and Health Inspectors and Agency Inspections.	41 / 42
1960.57 Training of safety and health inspectors.	41

1960.58 Training of collateral duty safety and health personnel and committee members.	41 / 42
1904 Subpart E, Reporting Fatality, Injury and Illness Information to the Government.	3
29 CFR 1904.10, Recording Criteria for Cases Involving Occupational Hearing Loss.	31
OSHA 3124-12R, Stairways and Ladders: A Guide to OSHA Rules.	13
OSHA 3150 2002 (Revised), A Guide to Scaffold Use in the Construction Industry.	13
OSHA Act 1970, Public Law 91-596, 84 Stat. 1590 (1970).	1
OSHA Brief, Hazard Communication Standard: Labels and Pictograms.	33
OSHA Letter of Interpretation, Clarification of Maintenance vs. Construction Activities. https://www.osha.gov/laws-regs/standardinterpretations/2003-11-18	37

21. General Services Administration (GSA)

Reference Paragraph	RSHS Section
U.S. General Services Administration (GSA). Accident Management Center (AMC).	39
U.S. General Services Administration (GSA). Fed Fleet 2020 Presentation. Regulations and Policies FAQ's.	39
U.S. General Services Administration (GSA). Federal Management Regulation Part 102- 34 – Motor Vehicle Management.	39
U.S. General Services Administration (GSA). Motor Vehicle Management Policy Overview.	39

22. Infrastructure Health and Safety Association

Reference Paragraph	RSHS Section
Hoisting and Rigging Safety Manual	16 / 18 / 19A / 19B

23. International Code Council

Reference Paragraph	RSHS Section
International Code Council. International Fire Code.	10

24. Motorola Solutions

Reference Paragraph	RSHS Section
Motorola Solutions. Environmental Health and Safety Tower Climbing Guidelines.	30
Motorola Solutions. Standards and Guidelines for Communication Sites.	30

25. National Aeronautics and Space Administration

Reference Paragraph	RSHS Section
National Aeronautics and Space Administration. Johnson Space Center Safety and Health Handbook, Chapter 2.3, “Hazard Analysis” (2002).	4

26. National Fire Protection Agency (NFPA) Publications

Reference Paragraph	RSHS Section
NFPA No. 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work.	10
NFPA No. 54/ANSI Z223.1, National Fuel Gas Code.	10
NFPA No. 58, Liquefied Petroleum Gas Code.	10
NFPA No. 70, National Electrical Code.	11 / 27
NFPA No. 70E, Standard for Electrical Safety in the Workplace.	8 / 12
NFPA No. 72, National Fire Alarm and Signaling Code.	10
NFPA No. 101, Life Safety Code.	6 / 10 / 44
NFPA No. 350, Guide for Safe Confined Space Entry and Work. (2019)	14
NFPA No. 600, Standard on Facility Fire Brigades.	10
NFPA No. 1977, Standard on Protective Clothing and Equipment for Wildland Fire Fighting.	10
NFPA No. 2001, Standard on Clean Agent Fire Extinguishing Systems.	10

27. National Institute for Occupational Safety and Health (NIOSH)

Reference Paragraph	RSHS Section
Criteria for Recommended Standard: Occupational Exposure to Heat and Hot Environments, 2016.	45
Heat Stress Acclimatization, 2017.	45
Noise and Hearing Loss Prevention, 2018.	31
Occupational Noise Exposure, Revised Criteria 1998.	31

28. National Oceanic and Atmospheric Administration

Reference Paragraph	RSHS Section
National Oceanic and Atmospheric Administration. Wind Chill Chart.	45

29. Navigation and Navigable Waters

Reference Paragraph	RSHS Section
Navigation and Navigable Waters. 33 C.F.R. 88.13 – Lights on moored barges.	28
Navigation and Navigable Waters. 33 C.F.R. 88.15 – Lights on dredge pipelines.	28

30. Nuclear Regulatory Commission

Reference Paragraph	RSHS Section
Nuclear Regulatory Commission. 10 CFR 20.2202, Notification of Incidents. § 20.2202 Notification of Incidents.	46
Nuclear Regulatory Commission. 10 CFR, Part 20, Standards for Protection Against Radiation.	46

31. Office of Personnel Management

Reference Paragraph	RSHS Section
Office of Personnel Management. 5 CFR 293, Personnel Records.	31

32. Reclamation Facilities Instructions, Standards, and Techniques (FIST)

Reference Paragraph	RSHS Section
1-1, Hazardous Energy Control Program.	9 / 12 / 14 / 15
2-9, Inspection of Unfired Pressure Vessels.	17
3-6, Storage Batteries Maintenance and Principles.	12
4-1A Maintenance Scheduling for Mechanical Equipment, Revised January 2009.	18 / 19A / 19B
5-1, Personal Protective Grounding for Electric Power Facilities and Power Lines.	12
5-14, Electrical Safety Program.	8 / 12
6-2, Conduct of Power Maintenance, March 2006.	19A / 19B
6-3, *Unexpected Event Reporting*	40

33. Reclamation Documents

Reference Paragraph	RSHS Section
O&M Guidance & Training Resources. Guidelines for The Process of Evaluating the Reliability of Mechanical Equipment During Dam Safety Comprehensive Facility Review Examinations.	19A
Concrete Manual Part 2: A Water Resources Technical Publication. Ninth Edition. (1992).	25
Concrete Manual: A Water Resources Technical Publication. Eighth Edition – Revised. (1981)	25
Diving Safe Practices Manual, Underwater Inspection Program, February 2021.	29
ENV 05-01, Environmental Management System (EMS) Implementation.	2
ENV PO5, The Bureau of Reclamation's Commitment to Environmental Stewardship.	2

HRM 02-02, *Workers' Compensation (WC)* Program	40
Invasive Mussels Prevention Measures.	28
National Aviation Management Plan (NAMP)	40
O&M Guidance & Training Resources. Review of Operation and Maintenance Program Field Examination Guidelines.	19A
SAF 01, Appendix A, Stop Work Authority Procedures.	22
SAF P01 Appendix A, Stop Work Procedures.	25
SAF P01, Safety and Occupational Health Program.	19A / 19B
SLE 08-03, Serious Incident Reporting and Duty Officer Program.	40
Trailer Annual Preventative Maintenance Inspection. 7-1776B (5-06)	28
Watercraft (Includes Inboard and Outboard Motors) Preventative Maintenance Inspection. 7-1776B (5-06)	28

34. State of Washington

Reference Paragraph	RSHS Section
Washington State Department of Labor and Industries. Industrial Safety and Health Act, Chapter 296-32 WAC, Safety Standards for Telecommunications (Form Number F414-017-000).	30

35. Telecommunications Industry Association

Reference Paragraph	RSHS Section
Telecommunications Industry Association. TIA-222-H, Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures.	30

36. United States Title 49

Reference Paragraph	RSHS Section
Title 49 Subtitle B Chapter I Subchapter A Part 177. Hazardous Materials Regulations; Carriage by Public Highway.	39
Title 49 Subtitle B Chapter III Subchapter B Part 383. Commercial Driver's License Standards; Requirements and Penalties.	39

37. United States Geological Survey (USGS)

Reference Paragraph	RSHS Section
United States Geological Survey. Occupational Safety and Health Program Requirements Handbook (445-2-H), Chapter 44, “Fall Protection Program.”	16

38. United States Code

Reference Paragraph	RSHS Section
U.S. Code Title 40, Subtitle II, Part A, Chapter 33, Acquisition, Construction, and Alteration.	44

39. University of North Carolina

Reference Paragraph	RSHS Section
University of North Carolina Department of Environment, Health and Safety. Job Safety Analysis (JSA) Library. https://ehs.unc.edu/workplace-safety/jsa/	4

Appendix D RSHS Process Management Framework

1. Overview

Appendix D, the Reclamation Safety and Health Standards (RSHS) Process Management Framework (Framework), memorializes processes for oversight, development, maintenance, and systems management of the bureau's comprehensive safety and occupational health requirements. The Framework provides instructions that direct RSHS management within a governance structure championing professional safety and occupational health subject matter expertise, organizational strategy and perspective, accountability, and informed decision making.

RSHS provides bureau-wide structure and baseline expectations designed to mitigate risk across the totality of Reclamation's work by its employees and contractors. Reclamation's Mission and Assurance Protection Organization (MAPO) Directorate, Preparedness Division, Safety and Occupational Health Office, leads, develops, promulgates, and provides reasonable assurance of effective internal control for the bureau's safety and occupational health program. Reclamation Leadership Team members responsible for the planning and accomplishment of work may establish and enforce more restrictive safety requirements above and beyond those established in RSHS, but never less than or counter to RSHS requirements, to further the demonstration of effective internal control and to promote safer work environments.

MAPO manages RSHS via a permanent deviation approved in accordance with requirements established in Reclamation Manual, Directive and Standard *Request for Deviation from a Reclamation Manual Requirement and Approval or Disapproval of the Request* (RCD 03-03). This Framework offers transparency about how Reclamation honors the purpose of deviations to practice and effectuate meaningful safety and occupational health requirements.

2. Background

The Framework and current version of RSHS reflect decades of safety and occupational health requirements management (i.e., policy development and management), lessons learned, and enhancement in the field of safety, wellbeing, and resilience. Developed to provide Reclamation-specific requirements heavily aligned to construction activities, RSHS evolved to promulgate requirements established by the Department of the Interior (DOI) as codified in Departmental Manual Part 485 and the Federal Occupational Safety and Health Administration.

In Fiscal Year 2023, Reclamation organized a safety and occupational health initiative team to evaluate RSHS' comprehensive systems management processes, decision making models, and lessons learned across decades of iterative policy management, specifically those garnered during the 2019-2022 comprehensive RSHS update project. The Framework reflects that team's work and recommendations to develop, maintain, implement, and manage RSHS requirements

within a unique governance structure that ensures Reclamation's safety and occupational health requirements serve the vision of the bureau's core value of safety.

3. Governance

a. Concept of Operations

The Reclamation Safety Standards Board (RSSB) governs the Framework. The RSSB promotes risk-informed decision making and organizational perspective to focus safety and occupational health standards across the wide array of Reclamation's diverse and critical mission activities in consideration of all employees and work performed.

The RSSB likewise tempers policy management practices and ensures the development of appropriate requirements for those subject matters that meet thresholds. Further, the RSSB balances organizational structure and autonomy relative to safety and wellbeing, prioritizing these in consideration of the totality of work and livelihood of humans, rather than any organizational alignments, delineations, or individual wants. RSSB ensures the RSHS content reflects objective and consistent requirements, not best practices more reflective of personal preference or desire.

Permanent staff and rotating team members with a vested and recurring interest in an effective RSHS compose the RSSB. With delegated authority to issue requirements and responsibility for safety and occupational health program oversight, MAPO Directorate staff serve voting and non-voting RSSB permanent member roles. With end-user impact and organizational perspective, rotating staff representing each region, select Operations Denver organizations, and affected communities of practice fulfill most RSSB positions (all voting members).

b. RSSB Membership

RSSB members serve 1-year terms, except for three MAPO positions that ensure continuity of knowledge and execution of RSSB decisions. The MAPO Director serves as executive sponsor given the position's authority to issue safety and occupational health requirements. The Preparedness Division Manager serves as RSSB chair, ensuring execution of and compliance with the Framework and to facilitate RSSB meetings and decision implementation. The executive sponsor and RSSB chair are ex officio, non-voting members. The Chief, Safety and Occupational Health Office (SOHO), has day-to-day operational oversight and execution duties as described in the Content Management Responsibilities section of this Appendix D. The SOHO Chief is a voting member.

Voting members include:

- Regional Deputy Director,
- Reclamation Safety Council member,
- Area Office Safety Professional,

- Regional Non-Safety and Occupational Health Supervisor,
- Regional Non-Safety and Occupational Health Non-Supervisor,
- Operations Denver Organization with Safety Tie-In representative,
- Affected Community of Practice representative, and
- Reclamation's DOI Safety Council representative (i.e., SOHO Chief).

See Table 1 for roles, voting status, and rotation schedule.

Role	Voting	FY 24	FY 25	FY 26	FY 27	FY 28
Deputy Regional Director	Yes	CGB	CPN	LCB	MB-ARGTG	UCB
Reclamation Safety Council (Regional Safety Manager)	Yes	CPN	LCB	MB-ARGTG	UCB	CGB
Area Office Safety Professional (Occupational Series 0018 or 0690)	Yes	LCB	MB-ARGTG	UCB	CGB	CPN
Regional Non-Safety and Occupational Health Supervisor	Yes	MB-ARGTG	UCB	CGB	CPN	LCB
Regional Non-Safety and Occupational Health Non-Supervisor	Yes	UCB	CGB	CPN	LCB	MB-ARGTG
Denver Operations Program Manager with SOH Tie-In (GS-14 or 15)	Yes	TSC	PRO	DSI	TSC	PRO
Affected Community of Practice (Chair or Vice Chair)	Yes	RDCCT	Other or RDCCT	RDCCT	Other or RDCCT	RDCCT
DOI Safety Council Member (Reclamation Representative)	Yes	SOHO Chief	SOHO Chief	SOHO Chief	SOHO Chief	SOHO Chief

Role	Voting	FY 24	FY 25	FY 26	FY 27	FY 28
RSSB Chair	No	PREP Division Manager	PREP Division Manager	PREP Division Manager	PREP Division Manager	PREP Division Manager
Executive Sponsor	No	P+P Director	P+P Director	P+P Director	P+P Director	P+P Director

Table 1 – RSSB membership. Note that the Chief, Safety and Occupational Health Office, is Reclamation's permanent representative to the DOI Safety Council. Note that the RDCCT Chair or Vice Chair will fulfill the Affected Community of Practice role in years when other affected communities opt not to serve on the RSSB.

c. RSSB Expectations

The RSSB generally meets once per term in person with one or more virtual meetings to prepare for the annual meeting and to address emergency-need threshold requests. Members unable to attend the annual meeting and/or fulfill obligations will resign their appointment or be removed by the Deputy Commissioner, Policy, Administration, and Budget, who serves as Reclamation's Designated Agency Safety and Health Official (DASHO). The DASHO will appoint a qualified replacement from within the member's area of consideration (e.g., in the case of a vacant Reclamation Safety Council representative member, the DASHO will appoint another regional safety manager to carry out the remaining term). Such appointments do not impact subsequent rotation schedules (i.e., organizational rotations will not be modified even when an appointment results in the same organization holding the same member role the following term).

When vacant, the DASHO may appoint an employee with commensurate authority who is temporarily occupying a permanent member role, for which there only exists one incumbent, through to the selection and onboarding of a permanent incumbent:

- Director, MAPO,
- Manager, Preparedness Division, and
- Chief, Safety and Occupational Health Office.

RSSB members otherwise are not authorized to delegate RSSB roles and responsibilities to actors nor proxy role authorities to others. Each RSSB member is responsible for their fully burdened labor, travel, per diem, and any other costs associated with their RSSB responsibilities. Reclamation Leadership Team members commit to funding and designation of required work time for members to fulfill RSSB duties.

d. Meeting Structure

The RSSB chair leads the annual meeting using the following agenda:

- Call to Order
- Roll Call
- Reports
    - Chair's Report on Accomplishment of RSSB Prior Term and Outstanding Action Items
    - Safety and Occupational Health Office Chief's Report on Organizational Lessons Learned and Advancements in the Profession of Safety and Occupational Health
- Staff Presentation on RSHS Status and Actions Requested of the RSSB to Fulfill the RSHS Process Management Framework
    - Content Management Activities
        - Maintenance of Existing Content
        - Recission of Existing Content
        - Development of New Content
    - Process Management Framework Activities
- Deliberations of Staff Presentations
- Decisions and Actions
    - Content Management
    - Process Management Framework
    - Other
- After Action Review
- Adjournment

The RSSB chair leads all other meetings using the following standing agenda:

- Call to Order
- Roll Call
- Reports
- Old Business
- New Business
- Adjournment

e. Meeting Quorum

RSSB defines a quorum as 6 (six) of 8 (eight) voting members present. The RSSB chair must affirm a quorum to call a meeting to order, accept a motion, conduct a vote, and to adjourn.

f. Voting Procedures

Any RSSB member can motion the chair. All motions require a second by a voting RSSB member. The RSSB chair must affirm the presence of a quorum to open and close a meeting and to initiate voting, including to accept a report (as reported or as modified by the RSSB), open and close discussion, and to hold a vote.

Each voting member may cast only 1 (one) vote in any called vote. No voting member may proxy their vote to another voting or non-voting member. There is no anonymous voting. Voting members may cast their 1 (one) vote as:

- Yea (i.e., in favor of the motion),
- Nay (i.e., not in favor of the motion), or
- Abstention (i.e., neither in favor nor not in favor of the motion).

Motions require a majority of voting members present to vote “Yea” to pass. Majority is defined as 50% of voting members present plus 1 voting member.

4. Content Management Responsibilities

a. Program Staff

The Reclamation Safety and Occupational Health Office (SOHO) manages RSHS development, maintenance, and oversight. The SOHO Chief leads a team of professional safety subject matter experts and program managers responsible for policy development and maintenance. The SOHO Chief assigns each RSHS section’s content management responsibilities to a specific SOHO team member (some RSHS sections may have more than one staff member assigned to content management duties, however, each section has only one primary/lead) for any content over which SOHO has subject matter expertise and/or delegated authority.

The SOHO Chief appoints a Staff Framework Coordinator to carryout Framework logistical, planning, and administrative responsibilities best aligned to the program office. The Staff Framework Coordinator:

- Trains and mentors RSHS Section Content Management Leads on Framework requirements.
- Develops and maintains SOHO standard operating procedures, templates, plans, and resources that implement Framework requirements.
- Liaises with non-SOHO content owners to provide written notification and guidance on Framework requirements.

- Manages annual and emergency publication and distribution processes.
- Leads the quadrennial and informed content management processes.
- Transmits final production documents to DOI Office of Safety and Health for posting to DOI resources (e.g., DOI Safety and Health app, references found on the DOI website) and to the Preparedness Division SharePoint Governance Team for posting to Reclamation resources.

b. Community of Practice Executive Sponsors

Executive sponsors of affected communities of practice with content ownership assign content management responsibilities to a specific community of practice team member. The Staff Framework Coordinator liaises with the applicable executive sponsor and provides written notice to the entity's executive sponsor and chair when Framework requirements direct the affected community of practice's involvement and/or action. The affected community of practice is thereafter responsible to comply with all Framework requirements.

c. RSHS Section Content Management Leads

RSHS Section Content Management Leads perform project management tasks to meet quadrennial review and informed content management requirements. RSHS Section Content Management Leads:

- Carryout Framework responsibilities to manage RSHS sections relative to quadrennial review and informed content management requirements and timelines.
- Analyze subject matter for appropriateness, adequacy, alignment to higher-level authorities, scope, effect, and organizational value.
- Recommend, recruit, and lead RSHS content project teams to create, maintain, revise, and/or rescind RSHS products.
- Author draft and/or final RSHS content and/or identify and guide authors of RSHS content for which the lead is not the primary author.
- Adhere to and promote to project team members expectations to comply with Plain Language requirements, the mandatory use of the assigned MAPO editorial function to assure compliance with all RSHS writing, presentation, and formatting requirements.
- Lead and/or coordinate through to completion any communications and outreach activities associated with assigned RSHS content.

5. Quadrennial Review Procedures and Criteria

The RSSB ensures each RSHS section remains accurate and applicable no less than once every five years (i.e., quadrennial review) through the review and analysis of approximately 20% of the RSHS every year. In compliance with RSHS Content Management assignments, content owners conduct review and analysis to identify findings and submit recommendations to RSSB. Quadrennial review and analysis include, at minimum:

- Comparison of existing requirements to higher-level authorities,
- Severity of potential revisions to establish and maintain a safe and compliant work environment,
- Opportunities to revise content based upon lessons learned since the last revision,
- Review and comment of the Regional Safety Managers, SOHO Chief, and/or affected communities of practice concerning inaccuracies, deficiencies, and/or clarifications required to improve compliance, use, and/or consistency among end users,
- Team members, perspectives, and/or subject matter expertise required to revise content, and
- Timeline and any other resource(s) required to revise content.

The Staff Framework Coordinator provides RSHS Section Content Management Leads standardized forms/documents to report and submit work (i.e., review, analysis, findings, and recommendation).

a. Recission of Existing Content Criteria

When existing content no longer meets Reclamation's need for bureau-specific requirements, section content management leads will analyze, in addition to quadrennial review criteria:

- Reason(s) for proposed recission,
- Direct and indirect impacts of recission to safe work performance,
- Effect on existing and/or proposed RSHS content or any other Reclamation requirement(s),
- Risk and cost considerations for recission or an alternate option (i.e., revise, format, maintain), and
- Specific action(s) required to effectuate a recission (e.g., notification, communication, education, training, publishing).

b. Development of New Content Criteria

When new content can improve, clarify, reinforce, and effectuate a safe working environment, because such content does not exist in the appropriate policy-oriented document, section content management leads will analyze, in addition to quadrennial review criteria:

- Existing content that could be considered to meet the requirement,
- Considerations and impacts of changes, direct and indirect, that may affect existing content via the creation of new RSHS content, and
- Any other factor that subject matter experts and/or decision makers should consider relative to new content creation.

c. Review and Analysis Findings and Recommendations

Section content management leads submit review and analysis outcomes (i.e., findings) and one of two recommendation options for RSSB consideration:

- Action recommended
    - Format (i.e., no change to existing requirements, but editorial, formatting, or reference change(s) required),
    - Revise (i.e., revision(s) will change existing requirement(s) and/or the content will be different after action(s) completed),
    - Develop (i.e., create new content), or
    - Rescind (i.e., section deletion).
- Action not recommended
    - Maintain (i.e., existing content sufficient to comply with requirements and guide compliant and safe working environments/conditions), and
    - Insufficient criteria/threshold(s) not met (i.e., review and analysis findings do not support requested action(s)).

6. Informed Content Management Outside of Quadrennial Review

The RSSB affords three pathways to manage and maintain RSHS content outside of quadrennial review. Three entities offer pathways to recommend out-of-sequence action:

- SOHO (i.e., program office),
- Reclamation Safety Council (i.e., team composed of the SOHO Chief, each Regional Safety Manager, and the Denver Office Safety Manager), and
- RSSB voting member (i.e., any of the 8 RSSB voting members as identified in the Governance section of this Framework).

Each entity/pathway develops and maintains its own practice(s) (e.g., email, intake form, meeting with point of contact) to receive, adjudicate, and respond to requests for RSHS content management outside of quadrennial review. Request delineations ensure reduction of duplication and accountability:

- SOHO manages all directives, assignments, and requests from:
    - higher-level authorities (e.g., Commissioner, Secretary),
    - entities holding authority or delivering recommendations (e.g., DOI Office of Safety and Health, OSHA, DOI Office of Inspector General) that necessitate Reclamation take a specified action that affects RSHS content, and
    - any other means by which a bureau-level program office receives and acts on authorities and responsibilities delegated and/or assigned to it (e.g., internal control, correction action plan mitigation effort, receipt of employee complaint for which SOHO has a responsibility to act).

- Reclamation Safety Council members receive and act on requests from employees and organizations specific to their regional organization.
    - Regional Safety Managers receive and act on requests from within their employing region in alignment to requirements established by regional management.
    - The Denver Office Safety Manager receives and acts on requests from Denver and Washington Office Directors in alignment to processes established and maintained by the SOHO.
- RSSB members receive and act on requests from affected communities of practice (e.g., Reclamation Design and Development Coordination Team, Reclamation Rope Access Board) not aligned to an organizational entity identified in a position description or delegation of authority.

Each entity/pathway informs its decision to act (i.e., conduct review and analysis) relative to criteria it establishes and publishes to its requestors. When the entity/pathway accepts a request for RSHS informed content management outside of quadrennial review, the entity/pathway must complete the review and analysis in accordance with the same requirements established for quadrennial review. The entity/pathway itself is responsible for the review and analysis (i.e., SOHO staff do not complete the review and analysis for the Reclamation Safety Council or RSSB) and subsequent procedures to present to RSSB for consideration.

Entities/pathways whose review and analysis results meet emergency-need thresholds criteria submit their completed work and associated recommendation to the Staff Framework Coordinator for affirmation of threshold review and RSSB notification and meeting processes. When requests do not meet emergency-need threshold, they will be considered during the annual RSSB meeting that considers and approves content for scheduled action.

7. Emergency Need Thresholds

While the Framework intends to manage, temper, and control consistent policy maintenance practices, situations materialize that necessitate emergent and/or immediate changes to Reclamation's safety and occupational health requirements. The following criteria constitutes emergency-need thresholds for the immediate and unobstructed application of Framework processes to achieve and/or maintain a safe work environment:

- Directive from a higher-level authority to institute policy change(s) relative to a change in higher-level law, rule, regulation, mandate, and/or policy bounded by an implementation deadline.

- Directive from an investigative authority and/or court of law authorized to issue and enforce findings, recommendations, judgment, penalties, remediations, and/or like actions bounded by an implementation deadline.
- Request from the Commissioner, Deputy Commissioner, Deputy Commissioner for Policy, Administration, and Budget, or Deputy Commissioner for Operations upon the written request of a Reclamation Leadership Team member (the permanent senior executive or senior level position) to revise, develop, and/or rescind RSHS content because the continued requirement(s) identified within the specific RSHS content pose an unacceptable risk to achieve and/or maintain a safe and/or compliant work environment.
- An incident (as defined in/by the/a/an Emergency Management; Security and Law Enforcement; Project Planning and Facility Operations, Maintenance, and Rehabilitation; and/or Land Management and Development policy or directive and standard) whose immediate and emergency-designated response requires the revision, development, and/or recission of RSHS content because of an immediate and unmitigable risk to achieve and/or maintain a safe and/or compliant work environment.
- Instructions from the Designated Agency Safety and Health Official to affect some aspect of RSHS content to ensure compliance with and/or presence of a compliant and/or safe work environment.

The Staff Framework Coordinator reviews all requests for application(s) of emergency-need thresholds. The Staff Framework Coordinator delivers the results of review to the RSSB executive sponsor for decision and subsequent action(s).

8. Revision, Development, and Recission Content Management Practices

When the RSSB accepts a recommendation to act (i.e., format, revise, develop, or rescind), RSHS Section Content Management Leads must follow requirements that ensure consistency, quality, and value-added work toward the maintenance of an effective RSHS. Revision and development actions require collaborative, team-based efforts to produce quality content that meets Reclamation-wide needs.

a. RSHS Section Content Management Leads

When revising and developing RSHS content, RSHS Section Content Management Leads must:

- Establish content teams with minimum membership of:
    - the RSHS Section Content Management Lead,
    - one Reclamation Safety Council member (but not the SOHO Chief), and
    - one non-SOHO subject matter expert, technical expert, or Reclamation employee with relevant knowledge, experience, and/or perspective reasonable to constitute an

informed perspective as to the impact and consequences of the content to the compliant and safe perform of Reclamation work,

- Author and/or identify, assign, and consolidate the work of a lead author for draft and final content,
- Submit all draft and final content for editorial services required of all written content ultimately managed under the authority of the Director, MAPO, via the MAPO assigned writer-editor,
- Distribute all draft content for 30-day review and comment to:
    - each Reclamation Safety Council member:
        - Regional Safety Managers,
        - Denver Office Safety Manager, and
        - SOHO Chief,
    - executive sponsors and chairs of affected community of practice identified in the RSSB review and analysis phase, and
    - any other organizational entity identified in the review and analysis phase as having a vested interest and/or definable impact,
- Review for comment adjudication:
    - no more than one consolidated and deconflicted comment matrix from each Regional Safety Manager,
    - no more than one organized comment matrix from the Denver Office Safety Manager that organizes comments by Denver and Washington organization and demonstrates deconfliction of comments within each Denver and Washington organization,
    - no more than one comment matrix from each affected community of practice and/or other entity identified in the RSSB review and analysis phase as having a vested interest and/or definable impact (comments that are obvious replications of comments submitted via Regional Safety Managers or the Denver Office Safety Manager will be ignored),
- Establish a consensus metric that defines content team agreement on comment adjudication,
- Involve content team members in the adjudication of comments,
- Provide a written response to all comments within a consolidated, master comment matrix for retention and posting to the SharePoint Preparedness Portal,
- Develop the content outreach plan when identified as a necessary or required component during the review and analysis phase,

- Submit the final document package (as defined in SOHO developed and managed documents) to the Staff Framework Coordinator for review, approval, and publication process activities,
- Oversee completion and accomplishment of content outreach plan requirements, and
- Perform any other tasks as assigned by the RSSB relative to RSHS content management and/or requirements as defined in SOHO procedural documents that implement Framework requirements.

When formatting or rescinding RSHS content, RSHS Section Content Management Leads must:

- Establish a content team when required or reasonably necessary based on findings identified in the RSSB review and analysis phase,
- Develop the content outreach plan,
- Oversee completion and accomplishment of content outreach plan requirements,
- Submit the final document package (as defined in SOHO developed and managed documents) to the Staff Framework Coordinator for review, approval, and publication process activities.

b. Regional Safety Managers and Denver Office Safety Managers

Regional Safety Managers and the Denver Office Safety Manager perform critical roles to ensure RSHS content reflects organizational needs that promote compliant and safe work environments, regardless the location, type, or purpose of work accomplished. When revising and developing RSHS content, Regional Safety Managers and the Denver Office Safety Manager must:

- Serve on content teams or coordinate among the Reclamation Safety Council to identify and secure representation when requested to do so by the RSHS Section Content Management Lead,
- Receive and disseminate draft content to appropriate and/or effected entities within the assigned scope (e.g., region, directorate) to collect objective comments,
- Deconflict comments from across the affected scope:
    - Regional Safety Managers – deconflict any regional comments, regardless the level of organizations and follow instructions of regional management to affirm submission of regional comments,
    - Denver Office Safety Manager – deconflict any comments within any single Denver or Washington organization at the senior executive level (e.g., Chief Engineer's Organization, MAPO Directorate) and submit one consolidated matrix that captures each organization's comments as distinct and separate,
- Deliver comments no later than the assigned deadline via the format/system required in the notice of opportunity to provide comments,

- Instruct organizations and/or entities within their scope/extent of representation on Framework requirements, and
- Perform any other tasks as assigned by the RSSB relative to RSHS content management and/or requirements as defined in SOHO procedural documents that implement Framework requirements.

9. Content Outreach Plans

RSHS Section Content Management Leads ensure the preparation and accomplishment of content outreach plans for all content determined to meet the requirements for outreach, education, training, and/or structured rollout. Content outreach plans include information and strategy to promote recognition/awareness, understanding, and adoption of content. Content outreach plans include, at minimum:

- Impacted organizations, entities, employees, and lines/types of work,
- Strategies to prepare, deliver, and assess the effect of information delivery and compliant application of content requirements,
- Communication medium(s) (e.g., memoranda, training, on-site instruction), timelines, and entities involved in communication content development and delivery, and
- Cost analysis (e.g., fully burdened labor, travel, materials) and funding sources to facilitate outreach efforts, and
- Roles and responsibilities for, at minimum:
    - Designated Agency Safety and Health Official,
    - Director, Mission Assurance and Protection Organization,
    - Affected Reclamation Leadership Team members,
    - Manager, Preparedness Division,
    - Chief, SOHO,
    - Content team members,
    - Reclamation Safety Council,
    - Impacted safety professionals,
    - Management officials,
    - Employees, and
    - Any other content-specific affected entity.

RSHS Section Content Management Leads must use SOHO developed and maintained content outreach plan templates to propose, prepare, and communicate outreach deliverables.

10. Publication and Distribution

The RSSB publishes the RSHS once per calendar year, with a planned target effective and release date of June 1 of the current year. The SOHO, via the Staff Framework Coordinator

manages publication and distribution processes, both directly and via services acquired from MAPO Directorate editorial functions, Reclamation publication management functions, and/or contracted resources.

SOHO develops and manages RSHS first and foremost as a digital product. SOHO posts approved RSHS content to 2 locations:

- Internal – Reclamation Preparedness Portal (https://doimspp.sharepoint.com/sites/bor-84-preparedness)
- External – Reclamation website (https://www.usbr.gov/safety)

SOHO establishes, documents, and manages processes that define annual data calls for hardcopy printing and distribution. Unless directly funded via annual appropriations to do so, SOHO provides each Regional Safety Manager and the Denver Office Safety Manager production and delivery costs as part of the annual data call to inform recipients of expected costs and to collect funding commitments and accounting strings at the time of request.

SOHO prepares and publishes, under the signature of the Designated Agency Safety and Health Official, an all-employee distribution memorandum that communicates annual updates by section and any other significant change to the RSHS no later than the date of the current year's publication and release.

When emergency-need threshold(s) dictate(s) a replacement of annually published content prior to the annual publication date, SOHO provides each entity that received a printed annual edition with the revised content and instructions to destroy replaced content with the revised content. SOHO prepares and publishes, under the signature of the Designated Agency Safety and Health Official, an all-employee distribution memorandum that communicates the off-cycle content release commensurate with its posting to internal and external online repositories.

Appendix E Communities of Practice with Life-Safety/High-Risk Operations Subject to and/or Informed by RSHS Requirements

Community of Practice	Sponsor
Facilities Operation and Maintenance Team Lead – Darion Mayhorn	Deputy Commissioner, Operations (David Palumbo)
Project Management Advisory Team	Deputy Commissioner, Operations (David Palumbo) Director, Mission Assurance and Protection Organization (Chris Beardsley) Director, Dam Safety and Infrastructure
Reclamation Design and Construction Coordination Team Chair – Tonya Hart	Director, Technical Services Center Regional Director, Missouri Basin-ARGTG (Brent Esplin)
Reclamation Diving Safety Advisory Board Chair -	Caireen Ulepic Sharon Eroschenko, Tech Svs Mgr, CPN
Reclamation Rope Access Board Chair – Corey Dickson	Regional Director, Missouri Basin-ARGTG
Reclamation Watercraft Safety Working Group Chair – Jim Burk	Director, Mission Assurance and Protection Organization (Chris Beardsley)
Technical Services Center (TSC) Safety Lead – Janet White	Director, Dick LaFond
Acquisitions and Contracting	Dianna Terrell

Appendix F Supplemental Safety and Health-Related Requirements Developed and Maintained by Designated/Chartered Entities External to RSHS

Requirement	Owner
Reclamation Diving Safe Practices Manual	Reclamation Diving Safety Advisory Board
Reclamation Guidelines for Rope Access	Reclamation Rope Access Board
Reclamation National Aviation Management Plan	Policy and Programs Directorate, Preparedness Division, National Aviation Program

Appendix G RSHS Content Ownership and Date of Last Review and Revision

Section	Title	Owner	Last Review	Last Revision
1.01	Scope, Authority, and Purpose	SOHO		12/15/2022
1.02	General Requirements	SOHO		12/15/2022
1.03	Contractor Requirements	SOHO		12/15/2022
1.04	Work Safety Planning	SOHO		12/15/2022
1.05	Medical Services and First Aid	SOHO		12/15/2022
1.06	Emergency Plans	SOHO		12/15/2022
1.07	Personal Protective Equipment	SOHO		12/15/2022
1.08	Signs, Signals, and Barricades	SOHO		12/15/2022
1.09	Fire Protection and Prevention	SOHO		12/15/2022
1.10	Electrical Safety Requirements	SOHO		12/15/2022
1.11	Walking and Working Surfaces	SOHO		12/15/2022
1.12	Confined Spaces and Permit-Required Confined Spaces	SOHO		12/15/2022
1.13	Control of Hazardous Energy (Lockout-Tagout)	SOHO		12/15/2022
1.14	Fall Protection	SOHO		12/15/2022
1.15	Hands Tools, Power Tools, Pressure Vessels, Compressors, and Welding	SOHO		7/14/2023
1.16	Hazardous Materials Emergency Response	SOHO		12/15/2022
1.17	Lone Worker and Remote Worker Safety	SOHO		12/15/2022
1.18	Life Safety Code Program	SOHO		12/15/2022
1.19	Hazard Communication Program	SOHO		12/15/2022
1.20	Safety and Occupational Health Program Evaluations	SOHO		12/15/2022
1.21	Motor Vehicle Safety	SOHO		12/15/2022
1.22	Accident Investigation and Reporting	SOHO		12/15/2022

Section	Title	Owner	Last Review	Last Revision
1.23	Safety Inspection and Abatement	SOHO		12/15/2022
1.24	Collateral Duty Safety Representatives	SOHO		12/15/2022
2.01	Exposure to Hazardous Chemicals in Laboratories	SOHO		12/15/2022
2.02	Asbestos	SOHO		12/15/2022
2.03	Lead Exposure Control Program	SOHO		12/15/2022
2.04	Heat and Cold Stress	SOHO		12/15/2022
2.05	Ionizing and Nonionizing Radiation	SOHO		12/15/2022
2,06	Health Hazard Assessments	SOHO		4/27/2023
2.07	Hearing Loss Prevention Program	SOHO		12/15/2022
2.08	Respiratory Protection Program	SOHO		12/15/2022
2.09	Bloodborne Pathogens	SOHO		12/15/2022
2.10	Occupational Health	SOHO		Pending - New Publication
3.01	Material Handling, Storage, and Disposal	SOHO		12/15/2022
3.02	Slings, Rigging Hardware, and Wire Rope	SOHO		12/15/2022
3.03	Permanently Installed (Fixed) Cranes	SOHO		12/15/2022
3.04	Mobile Cranes	SOHO		12/15/2022
3.05	Mobile and Stationary Mechanized Equipment	SOHO		4/20/2023
4.01	Excavation Operations	RDCCT		12/15/2022
4.02	Tunnel and Shaft Construction	RDCCT		12/15/2022
4.03	Blasting Operations	RDCCT		10/2009
4.04	Concrete, Masonry, and Formwork	RDCCT		12/15/2022
4.05	Steel Erection	RDCCT		12/15/2022
4.06	Reclamation Drilling Standards	RDCCT		12/15/2022
4.07	Diving Operations	RDSAB		12/15/2022

Section	Title	Owner	Last Review	Last Revision
4.08	Tower Climbing Safety	SOHO		12/15/2022
4.09	Work Zone Safety	SOHO		10/15/2023
4.10	Scaffolding	SOHO		Scheduled for development in FY24 – New Publication
4.11	Welding	SOHO		Scheduled for development in FY24 – New Publication
4.12	Watercraft and Dredging	RWSWG		12/15/2022
4.13	Specialty Use Equipment	SOHO		9/1/2023
4.14	Towable Trailer Safety	SOHO		Comments under adjudication 11/6/2023

RDDCT – Reclamation Design and Development Coordination Team

RDSAB – Reclamation Diving Safety Advisory Board

RWSWG – Reclamation Watercraft Safety Working Group

SOHO – Safety and Occupational Health Office (Policy and Programs Directorate, Preparedness Division)