DRAFT RECLAMATION SAFETY AND HEALTH STANDARDS
RELEASE
Comments on this draft release must be submitted to ksomolinos@usbr.gov by [3/18/22].

Background and Purpose of the Following Draft Reclamation Safety and Health Standards (RSHS)

The RSHS are being updated by the Bureau of Reclamation Safety and Occupational Health Office to reflect new guidance from Reclamation, the Department of the Interior, and the Occupational Safety and Health Administration. This public release is intended to provide the public an opportunity to comment on each updated section in draft form. This process will enhance transparency and eliminate potential confusion about Reclamation’s safety standards.

The RSHS are incorporated into the Reclamation Manual through SAF 01-01, *Occupational Safety and Health Directive – General*. The Reclamation Manual is used to clarify program responsibility and authority and to document Reclamation-wide methods of doing business. All requirements in the Reclamation Manual are mandatory for Reclamation employees.

See the following pages for the draft RSHS.
Section 17

Hand and Power Tools, Pressure Vessels, Compressors, Chainsaws, and Welding

17.1 Scope
This section sets forth the requirements for the operation and maintenance of hand tools, power tools, pressure vessels, compressors, chainsaws, and welding. 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.

17.2 General Requirements
All welding and cutting operations shall comply with the current edition of American National Standards Institute (ANSI) Z49.1, Safety in Welding, Cutting, and Allied Process. All tools or equipment must be evaluated for noise levels and follow Reclamation Safety and Health Standard (RSHS) Section 31, Hearing Loss Prevention Program.

17.3 Responsibilities
17.3.1 Facility Manager—Welding
17.3.1.1 Shall ensure their facility has a written hot work operations plan, per RSHS 10, Fire Prevention and Protection, paragraph 8.7, Hot Work Operations Plan.
17.3.1.2 Shall designate in writing the authorizing individual for hot work permitting.
17.3.1.3 Shall ensure that permanently designated hot work areas in their facility are identified.
17.3.1.4 Shall designate the responsible person for authorizing cutting and welding operations for areas not specifically designed for hot work.

17.3.2 Facility Manager—Pressure Vessels
17.3.2.1 Shall maintain a log or recordkeeping process for pressure vessel inspections and permits.
17.3.2.2 Shall schedule all pressure vessel inspections at least every 5 years.
17.3.2.3 Shall hang or prominently display the current permit on or close to the pressure vessel.
17.3.3 First-Line Supervisors—General

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

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

17.3.4 First-Line Supervisors—Welding

17.3.4.1 Shall ensure flammable substances are not in the spark zone of any welding activities.

17.3.4.2 Shall ensure employees conduct all hot work per the hot work permit.

17.3.4.3 Shall establish controls for designated cutting and welding areas based upon the fire potentials of the plant or facility where hot work will happen.

17.3.4.4 Shall ensure hot work equipment is approved for the type of hot work performed.

17.3.4.6 Shall advise the contractor of hazardous conditions in hot work areas.

17.3.5 First-Line Supervisors—Compressed Gas

17.3.5.2 Shall ensure the handling, storage, and utilization of all compressed gases in cylinders and portable tanks is in accordance with Compressed Gas Association Pamphlet P-1-1965, which is incorporated by reference as specified in Sec. 1910.6.

17.3.5.3 Shall visually inspect compressed gas cylinders prior to use in accordance with the most recent Compressed Gas Association Pamphlet C-6.

17.3.5.4 Shall ensure employees transport compressed gases according to 49 CFR, Parts 171-179 and 14 CFR, Part 103.

17.3.5.5 Shall ensure employees complete training in paragraph 17.4.3, Initial—Compressed Gas Training of this RSHS.

17.3.6 First-Line Supervisors—Hand Tools

17.3.6.1 Shall ensure the safe condition of tools and equipment.

17.3.6.2 Shall ensure employees are trained in accordance with paragraph 17.4, Training Requirements, before employees operate and maintain shop equipment.

17.3.6.3 Shall ensure employees properly store all tools at the end of each work shift.

17.3.6.4 Shall ensure employees tag and remove damaged or defective tools from service until repaired. If the tool cannot be repaired, the tool must be destroyed using the appropriate method so it cannot be returned to service.
17.3.7 First-Line Supervisors—Power Tools

17.3.7.1 Shall keep the manufacturer 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 manufacturer’s owner’s manual cannot be obtained.

17.3.7.2 Shall ensure employees are trained in accordance with paragraph 17.4, before employees operate and maintain equipment.

17.3.7.3 Shall ensure employees properly store all tools at the end of each work shift.

17.3.7.4 Shall ensure employees tag or remove damaged or defective tools from service until repaired. If the tool cannot be repaired, the tool must be destroyed using the appropriate method so it cannot be returned to service.

17.3.8 Employees—General

17.3.8.2 Shall follow all requirements of this section.

17.4 Training Requirements

17.4.1 Initial—Hand and Power Tools

Before initial use, the supervisor or an assigned on-the-job trainer will train employees 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 the employee passes a proficiency check by their first-line supervisor.

17.4.2 Initial—Chainsaws


- be provided at no cost to employees,
- be provided prior to the employee performing chainsaw-related work,
- be provided whenever an 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 the recognition of safety and health hazards associated with an 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,
include a written certification, signed by the supervisor, that contains the name of the employee trained, the dates of training, and the signature of the person who conducted the training, and

a refresher or recertification whenever an employee demonstrates unsafe performance.

17.4.3 Initial—Compressed Gas Training

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

- RSHS Section 33, Hazard Communication Program paragraph 33.4.1, 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.

17.4.4 Certification—Welding

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

17.4.4.1 Recertification—Welding

Welders must follow the AWS, or appropriate governing organization requirements, to gain regular recertification.

17.4.5 Refresher—General

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

17.4.6 Lack of Proficiency—General

Retraining is necessary when an employee demonstrates a lack of knowledge of the training elements identified in paragraph 17.4.

17.4.7 Recordkeeping—General

17.4.7.1 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).
17.4.7.2 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.

17.5 Hazard Identification, Assessment, and Safety Measures

17.5.1 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 supervisor shall create the JHA per paragraph 17.6.1, Job Hazard Analysis (JHA). First-line supervisors shall ensure employees are trained per paragraph 17.4.

17.5.2 Safety Measures—Compressed Gas

17.5.2.1 Prohibited Work Activities
The first-line supervisor shall ensure the following work practices are implemented for employees when working with compressed gases. Employees shall never:

- 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 below 25 pounds per square inch (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; the employee shall always contact the supplier for this,
- use the recessed top of the cylinder as a storage area for tools or materials,
- interchange equipment between different types of gases,
- 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
- permit smoking or open flame sources where cylinders are stored.

17.6 Pre-job Briefing and Planning Requirements

17.6.1 Job Hazard Analysis (JHA)

17.6.1.1 The first-line supervisor and the employees doing the work shall conduct the JHA planning and review and shall ensure the written JHA includes appropriate handling,
use, inspection, storage, and transport procedures for job tasks. First-line supervisor shall ensure a post-job JHA review is conducted per RSHS 4, Work Safety Planning, paragraph 5.4.9, Post-job JHA Review.

17.6.1.2 First-line supervisors should 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.

17.6.2 Hot Work Permit
Shall comply with RSHS 10. Any hot work conducted outside of a designated hot work area requires a hot work permit.

17.6.3 Pressure Vessel Inspections
Facilities Instructions, Standards, and Techniques (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 should consult FIST 2-9 prior to any job involving a pressure vessel.

17.7 Hazardous Environmental Conditions (Weather/Other)

17.7.1 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 14, Permit Required Confined Spaces and Confined Spaces.

17.8 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 8, Personal Protective Equipment.

17.8.1.1 Additional Welding or Hot Work Operations PPE
Additional PPE is required for welding operations. Reference RSHS 8, paragraph 10.3, Personal Protective Equipment—Welding Protection.

17.8.1.2 PPE Requirements When Operating Chainsaws
Employees must utilize the following PPE items when operating chainsaws:

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

17.9 Other Safety Equipment

17.9.1 Fire Extinguishers
First-line supervisors must make fire extinguishers, rated 2-A; 40-B:C units or larger, immediately available in areas of hot work.

17.10 Safe Practices

17.10.1 Welding/Hot Work
Supervisors must assign fire watchers when employees perform welding/hot work in locations where fire might develop. Each employee performing welding/hot work must:
• have a copy of, and follow, the hot work permit,
• take appropriate actions to protect other employees or staff near welding and cutting work from exposure to welding rays, molten metal, and slag,
• use welding screens in repair shops and other areas where welding is regularly performed and the equipment must be appropriate to the welding work,
• protect against inadvertent changes to air/gas mixture ratios,
• check grounding of machine frame and safety ground connections of portable machines periodically,
• turn off power when leaving portable machines unattended,
• not coil or loop welding electrode cables around employee’s bodies,
• ensure cable connectors are adequately insulated,
• keep work environments free from combustible debris and ensure they are adequately ventilated,
• ensure the hot work permit remains in place until the work is complete, and
• complete training and obtain certification per paragraph 17.4.4, Welding Certification.

17.10.2 Compressed Gas Handling
The first-line supervisor shall ensure employees are aware of and use the following work practices when handling compressed gases. Employees must:
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 or other material handling equipment to move cylinders,

ensure protective valve caps are securely on cylinders when idle or transported,

ensure cylinders are equipped with valves, hoses, connectors, and regulators and that 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,

when transporting or moving compressed gas cylinders with a crane, hoist or derrick ensure the cylinders are placed in a cradle, net or skip,

never transport compressed gas cylinders by slings, chains, or magnets,

attend initial training in paragraph 17.4.3,

conduct visual gas cylinder inspections prior to use and shall immediately report any leaking, damaged, or malfunctioning cylinders to the first-line supervisor,

review the JHA before handling, using, storing, or transporting compressed gases, and follow all identified precautions and risk minimization protocols, and

never use any leaking, damaged, or malfunctioning cylinders.

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

store cylinders separately from flammable or combustible materials by at least 20 feet or by a fire-resistive partition with at least a 1-hour fire-resistive rating of at least 5 feet in height,

store cylinders in dry, well-ventilated areas away from exits and stairways,

store containers off the ground and out of extremely hot or cold environments if storing cylinders outside,

ensure cylinders containing a flammable or oxidizing gas are not stored near an ignition source,
• make a properly rated and sized fire extinguisher available where compressed gases are stored and 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
• not use oxygen or other compressed gases as a substitute for compressed air.

### 17.10.4 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. Employees must

• always keep removable caps and valve outlet caps/plugs on containers except when connecting to dispensing equipment,
• follow paragraph 17.4.3 when using or storing oxyfuel-gas containers for welding, cutting, and other similar activities,
• ensure the valve wrench or wheel is in the operating position when the cylinder is in use,
• always open cylinder valves slowly and never turn the valve to the fully open position,
• keep cylinders upright and away from heat, sparks, fire, or electrical circuits,
• ensure the valve wrench or wheel must be in the operating position when the cylinder is in use,
• keep oxygen cylinders and fittings free of oil or grease,
• not use oxygen cylinders with oily hand or gloves,
• not direct oxygen at oily surfaces, greasy cloths, or into a container, storage tank, or vessel, and
• ensure the cylinder valve is fully shut off when gas is not in use.

### 17.10.5 Transporting Compressed Gases

The first-line supervisor shall ensure employees have the appropriate training for transporting compressed gases on a public road or highway, according to U. S. Department of Transportation regulations 49 CFR Parts 171-179 for hazardous materials.

### 17.10.6 Material and Warning Signage for Compressed Gases

First-line supervisors must place warning signs (e.g., DANGER, NO SMOKING, NO OPEN FLAME, NO IGNITION SOURCES) in areas where fuel gases are used or stored. Material signs should be used for stored cylinders. Signs must comply with Table 1 of ANSI Z53.1-
17.10.7 Hand Tools

The first-line supervisor shall ensure employees are aware of and use the following work practices when using hand tools. Employees must:

- leave powder-actuated tools unloaded until ready for use,
- inspect powder-actuated tools for obstructions or defects prior to use,
- store each tool individually in a locked container when not in use,
- recondition or replace 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,
- store tools in a dry, secure location when not in use
- replace worn or bent wrenches,
- use the appropriate handles on hand tools
- service and lubricate jacks on a regular basis, and
- never use jacks beyond their rated capacity.

17.10.8 Portable Powered Tools

Powered tools must comply to the following requirements.

- Powered tools must have the appropriate machine guarding.
- Manufacturer machine guarding shall not be tampered with, adjusted beyond original specifications, or be 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.
- The maximum revolutions per minute (rpm) rating of each abrasive wheel machine shall not exceed the rpm rating of the motor.
- Abrasive wheel machinery must have a built-in on/off control switch.
- Employees must ring test new abrasive wheels before mounting.
- Employees must permanently mount bench and pedestal grinders.
- Dust collectors and powered exhausts must be provided on mounted grinders that produce large amounts of dust or fine particles.
- Grinders that use coolant must have mounted splash guards.

17.11 Use and Maintenance

17.11.1 Hand Tools, Power Tools, and Chainsaws

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

- use, inspect, and maintain all tools in accordance with the manufacturer's instructions and recommendations,
- only use tools for the purpose/use intended,
17.12 Definitions

**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.

**Compressed gas**
Any non-flammable material or mixture having a pressure exceeding 41 psia (3 bar) at 70 degrees Fahrenheit (21 degrees Celsius) or any flammable or poisonous material in gaseous form at 70 degrees Fahrenheit (21 degrees Celsius) and has a pressure of 14.7 psia (1 bar) or greater.

**Machine guarding**
A safety feature on or around machinery that consists of a shield or cover or other device to prevent contact with body parts, catching loose clothing items, or control flung chips or sparks.

**Pressure vessel**
A tank or cylinder vessel designed to operate at pressures above 15 pounds per square inch gauge (p.s.i.g). (e.g., external air receivers and internal air receivers in oil separators, compressed air systems, governor tanks, boilers).

**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.

**Powder-actuated tool**
Fastening tool actuated by explosives, or any similar means, designed to propel a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object.

17.13 References


