DRAFT RECLAMATION SAFETY AND HEALTH STANDARDS
RELEASE
Comments on this draft release must be submitted to acryns@usbr.gov by [11/30/20].

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 15
Control of Hazardous Energy (Lockout/Tagout)

15.1 Scope
This section sets forth requirements for safely controlling hazardous energy, via processes commonly known as “lockout/tagout” (LOTO). Hazardous energy is the unexpected energization, release of stored potential energy, or startup of machines which can injure employees or cause property damage. This section specifically addresses installing, removing, servicing, and maintaining these machines or equipment. It establishes minimum performance requirements to control hazardous energy at all Reclamation-operated facilities. For additional guidance on working safely with electrical energy, see RSHS Section 12, Electrical Safety Requirements. This section does not apply to:

15.1.1 Cord and Plug Equipment
Work on cord and plug-connected electric equipment in which unplugging the equipment from the energy source controls the exposure to the hazards of unexpected energization, startup of the equipment, and the release of stored potential energy, and the plug is under the exclusive control of the employee servicing or maintaining the equipment.

15.1.2 Hot Tap Operations
Hot tap operations involving transmission and distribution of substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided the facility demonstrates:
- continuity of service is essential;
- shutdown of the system is impractical; and
- documented procedures are followed, and special equipment is used which will protect employees.

15.1.3 Normal Production Operations
Normal production operations are not covered by this section. Servicing and/or maintenance which takes place during normal production operations is covered by this section only if an employee is required to remove or bypass a guard or other safety device; or an employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle. An exception is minor tool changes and adjustments, and other minor servicing activities, which
take place during normal production operations. This is not covered by this section if they are routine, repetitive, and integral to the use of the equipment for production, provided the work is performed using alternative measures which provide effective protection.

15.2 General Requirements
Reclamation's objective has always been, and will remain, to de-energize and lock out all mechanical equipment using approved hazardous energy control procedures when installing, removing, servicing, and maintaining machines or equipment. Hazardous energy control programs (HECP) must include an inventory of equipment which can be locked out, lockout procedures, release procedures, and training. Engineering and administrative controls shall be implemented to reduce exposure to hazardous energy whenever feasible.

This section incorporates all the requirements of Occupational Safety and Health Administration (OSHA) 29 CFR 1910.147 *The control of hazardous energy (lockout/tagout)*. Where this section does not provide specific instructions, it adopts, by reference, the current edition of Facilities Instructions, Standards, and Techniques (FIST) Volume 1-1, *Hazardous Energy Control Program*.

15.3 Responsibilities

15.3.1 Area Office Managers
15.3.1.1 Shall designate in writing a Program Coordinator and support implementation of the HECP.

15.3.2 Program Coordinators
15.3.2.1 Shall provide technical support for implementing the facility or area HECP.
15.3.2.2 Shall complete HECP training per requirements in section 15.4 and be an authorized employee.
15.3.2.3 Shall coordinate with facility staff to review the HECP program and inventory to ensure the program is adequate and up to date.
15.3.2.4 Shall coordinate with first-line supervisors for review of job hazard analyses (JHAs) involving HECP.
15.3.2.5 Shall provide and/or coordinate training for all employees on the HECP program, per requirements in section 15.4.
15.3.2.6 Shall, in coordination with the first-line supervisor, investigate any near miss or incident involving control of hazardous energy.
15.3.2.7 Shall conduct a periodic inspection of the energy control procedures at least annually to ensure procedures and requirements of this section are being followed.

15.3.3 First-Line Supervisors
15.3.3.1 Shall ensure employees are trained annually on the HECP program per requirements in section 15.4, understand the purpose and procedures of the HECP, and acquire the knowledge and skills to safely apply, use, and remove LOTO devices.

15.3.3.2 Shall ensure hazard assessments and JHAs address the control of hazardous energy.

15.3.3.3 Shall ensure the Program Coordinator is included in the review for all JHAs involving HECP.

15.3.4 Authorized Employees
15.3.4.1 Shall complete HECP training per requirements in section 15.4.

15.3.4.2 Shall be the only persons to affix or remove LOTO devices to machines or equipment.

15.3.4.3 Shall verify completion of machine or equipment isolation and de-energization prior to start of work.

15.3.4.4 Shall notify affected employees after LOTO devices have been placed or removed and before machines or equipment are started.

15.3.4.5 Shall follow the release from LOTO procedures in subsection 15.10.1.7.

15.3.5 Affected Employees
15.3.5.1 Shall be instructed in the purpose and use of energy control procedures per requirements in section 15.4.

15.3.5.2 Shall not work on equipment that is locked or tagged out.

15.3.5.3 Shall be instructed about the procedure and prohibitions relating to attempts to restart or reenergize machines or equipment that are locked out or tagged out.

15.3.6 Joint Host and Contract Employer
15.3.6.1 Whenever a contractor or non-agency organization is involved in construction, maintenance, or testing on or near equipment in a Reclamation facility, a special work permit is required to authorize the contractor or non-agency employee to proceed with the work. See FIST 1-1, Hazardous Energy Control Program for more detailed HECP guidance for contractors and non-agency organizations.
15.3.6.2 Contractor personnel performing work at Reclamation-operated or -maintained facilities shall comply with all existing hazardous energy control procedures of the facility and this section.

15.4 Training Requirements

15.4.1 Initial
All employees involved with hazardous energy control procedures must have initial training and demonstrate working knowledge of hazardous energy control policies and local programs and procedures. Training must include the following:

15.4.1.1 Authorized Employees. Each authorized employee must receive training in recognizing applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control as it relates to the work they perform.

15.4.1.2 Affected Employees. Each affected employee must be instructed in the purpose and use of energy control procedures.

15.4.1.3 Others in the Work Area. All other persons whose work is, or may be, in an area where energy control procedures may be used, must be instructed about the procedures and prohibitions relating to attempts to restart or reenergize machines or equipment which are locked or tagged out.

15.4.2 Proficiency
Authorized and affected employees must demonstrate understanding of the HECP by taking and passing an examination administered by the Program Coordinator.

15.4.3 Refresher Training
Provide retraining at least annually; for all authorized and affected employees whenever job assignments, systems or processes present a new energy control hazard, or when energy control procedures change; and/or whenever any inspection reveals, or there is reason to suspect, deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

15.4.4 Recordkeeping
HECP training records shall be kept in the Department of the Interior official repository.

15.5 Hazard Identification, Assessment, and Safety Measures
15.5.1 **Survey of Machinery and Equipment**

The Program Coordinator shall conduct a survey to identify machinery and equipment capable of unexpected energization, release of stored energy, or startup. The purpose of the survey is to develop and maintain an inventory of machines and equipment which fall under the facility’s HECP program.

15.5.2 **Hazard Controls**

Reclamation’s objective is to eliminate or minimize exposure to LOTO hazards. The primary tool Reclamation uses is the hierarchy of controls, which prioritizes hazard controls in order from most effective to least effective. The following order of precedence shall be employed to reduce risks:

- Hazard elimination
- Product substitution
- Isolating hazards
- Engineering controls
- Administrative controls (e.g., reducing exposure of affected employees, housekeeping, etc.)
- PPE

15.6 **Pre-job Briefing and Planning Requirements**

15.6.1 **Job Hazard Analyses**

The first-line supervisor and Program Coordinator shall be involved in JHA planning and review. The job supervisor shall ensure the JHA reflects site conditions and employees working on site have been informed of its content. The first-line supervisor must review and sign the JHA prior to work beginning.

15.6.2 **Energy Control Procedure**

The procedures must clearly and specifically outline the scope, purpose, authorization, rules, and techniques to control hazardous energy and the means to ensure compliance including, but not limited to, the following:

- A specific statement of intended use of the procedure;
- Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy;
- Specific procedural steps for verification of these actions;
- Specific procedural steps for placing, removing, and transferring lockout or tagout devices and the responsibility for them; and
- Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.
15.6.3 Periodic Inspection

15.6.3.2 Frequency. The Program Coordinator shall conduct a periodic inspection of the energy control procedures at least annually to ensure procedures and requirements of this section are being followed.

15.6.3.3 Authorized Employee. The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

15.6.3.4 Identification. The periodic inspection shall be conducted to correct any deviations or inadequacies identified, including identifying all sources of potential hazardous energy.

15.6.3.5 Responsibility Review. Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of each employee's responsibilities under the energy control procedure being reviewed.

15.6.3.6 Certification. The Program Coordinator shall certify the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

15.6.4 Documentation

Documentation of procedures for a specific machine or equipment is not required when all the following elements exist:

- The Program Coordinator can prove the machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutdown which could endanger employees;
- The machine or equipment has a readily identified and isolated, single energy source which will completely deenergize and deactivate the machine or equipment;
- The machine or equipment is isolated from an energy source and locked out during installation, removal, servicing, or maintenance;
- A single lockout device will achieve a locked-out condition;
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance and
- The Program Coordinator can prove the servicing or maintenance does not create hazards for the employee servicing it or other employees.

15.7 Hazardous Environmental Conditions (Weather/Other)
LOTO devices must be capable of withstanding the environment for the maximum expected exposure. The construction and printing of tagout devices must prevent the tag from deteriorating or the message on the tag from becoming illegible when exposed to weather conditions or wet and damp locations. Tags must not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

15.8 Personal Protective Equipment (PPE)

15.8.1 Training
HECP participants must be trained on the reason for, proper use and fit, and limitations of PPE and other safety equipment required for working on locked out or tagged out equipment and machinery.

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

15.9 Other Safety Equipment
Use locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware to isolate, secure, or block machines or equipment from energy sources per the HECP.

15.9.1 Device Requirements
LOTO devices must be uniquely keyed, or a set of locks with a single key controlled by the authorized employee. Spare keys must not be created or used. LOTO devices must be singularly identified, must be the only device(s) used to control energy, must not be used for other purposes, and must meet the following requirements:

15.9.1.1 Durable. LOTO devices must be capable of withstanding the environment for the maximum expected exposure, per requirements in section 15.7.

15.9.1.2 Standardized. Lockout devices within the facility must be of the same color, shape, and size.

15.9.1.3 Substantial.
15.9.1.3.1 Lockout Devices. Lockout devices must be substantial enough to prevent removal without using excessive force or unusual techniques, such as bolt cutters or other metal-cutting tools.

15.9.1.3.2 Tagout Devices. Tagout devices, including the means of attachment, must be substantial enough to prevent inadvertent or accidental removal. The means to attach tagout devices must be non-
15.9.1.4 Identifiable. LOTO devices must indicate who applied the device(s).

15.9.2 Limitations of Tags

Employees and others in the work area must understand the use and limitations of tags.

- Tags are warning devices affixed to energy isolating devices and do not provide the physical restraint provided by a lock;
- A tag attached to an energy isolating device must not be removed without authorization of the employee responsible for it, and it must never be bypassed, ignored, or otherwise defeated;
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are in, or may be in, the area;
- Tags may evoke a false sense of security; understanding hazards, verification, and absolute vigilance must be understood as part of the overall energy control program; and
- Tags must be securely attached to energy isolating devices so they cannot be inadvertently or accidentally detached during use.

15.10 Safe Practices

15.10.1 Application of Energy Control

The established procedures for applying energy control (the lockout or tagout procedures) must cover the following elements and actions and must be done in the following sequence:

15.10.1.1 Preparation for Shutdown. Before an authorized or affected employee turns off a system (machine or equipment), the authorized employee must review the energy control procedure to confirm the type and magnitude of the energy, the hazards of the energy to be controlled, and the methods or means to control the energy.

15.10.1.2 System (Machine or Equipment) Shutdown. Turn off or shut down the machine or equipment, using the documented procedures established for the machine or equipment. Follow the documented shutdown procedures to avoid any additional or increased hazard(s) to employees resulting from equipment stoppage.

15.10.1.3 System (Machine or Equipment) Isolation. Physically locate and operate each energy isolating device needed to control the energy to the machine or equipment to isolate it from the energy source(s).

15.10.1.4 Lockout or Tagout Device Application
LOTO device application shall meet the following requirements:

- Only authorized employees may affix lockout devices to each energy isolating device;
- Affix lockout devices, where used, to hold the energy isolating devices in a "safe" or "off" position;
- Affix tagout devices, where used, to clearly indicate that operating or moving energy isolating devices from the "safe" or "off" position is prohibited;
- Systems with energy isolating devices which are capable of being locked out must use locking devices;
- If you cannot physically affix locking devices, use tagout devices at the same point of attachment as a locking device. A tag should never be used in lieu of a lock; and
- If you cannot affix a tag directly to the energy isolating device, locate the tag as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

15.10.1.5 Stored Energy. Energy storage devices or equipment capable of storing energy may include, but are not limited to, capacitors; power electronic equipment; pneumatic, such as plant service compressed air and governor pressurized oil systems; and mechanical, such as raised gates and charged springs.

- After affixing lockout devices to energy isolating devices, relieve, disconnect, restrain, block or bleed all potentially hazardous stored or residual energy; and
- If stored energy can reaccumulate to a hazardous level, continue to verify isolation until the employee completes servicing or maintenance, or until the possibility of such accumulation no longer exists.

15.10.1.6 Verification of Isolation. Before starting work on locked or tagged out machines or equipment, the authorized employee must verify completion of machine or equipment isolation and de-energization.

15.10.1.7 Release from Lockout or Tagout. Before removing LOTO devices and restoring energy to the machine or equipment authorized employees must follow procedures and take actions to ensure the following:

15.10.1.7.1 The Machine or Equipment. Inspect the work area to ensure non-essential items have been removed and machine or equipment components are operationally intact.

15.10.1.7.2 Personnel. Check the work area to ensure all employees have been safely positioned or removed.

- Before removing LOTO devices and before energizing machines or equipment, notify affected employees; and
- After removing LOTO devices and before energizing machines or equipment, notify affected employees.
15.10.1.7.3 **Lockout or Tagout Device Removal.** The employee who affixed each LOTO device must remove it from each energy isolating device. If the employee is not available to remove it, the Area Office Manager may remove the device provided specific procedures and training for such removal have been developed, documented, and incorporated into the employer's energy control program. The Area Office Manager must demonstrate the specific procedure includes at least the following elements:

- Verification by the Area Office Manager that the authorized employee who applied the device is not at the facility;
- Making all reasonable efforts to inform the authorized employee that his/her LOTO device has been removed;
- Documentation of efforts to inform the authorized employee; and
- Ensuring the authorized employee has this knowledge before he/she resumes work at the facility.

15.10.1.8 **Requirements of Operating Locked Out Equipment.**

15.10.1.8.1 **Testing or Positioning of Machines, Equipment or Components.** If temporary lockout devices must be removed from the energy isolating device and energize the machine or equipment to test or position the machine, equipment, or component, follow the following sequence of actions:

- Clear the machine or equipment of tools and materials, referring to the release from lockout subsection 15.10.1.7;
- Remove personnel from the machine or equipment area, following subsection 15.11.1. Be thoroughly familiar with the requirements of this RSHS section;
- Remove LOTO devices referring to the subsection 15.10.1.7.3 on LOTO device removal;
- Ensure clear line-of-sight and/or communication is maintained between all employees performing testing or positioning;
- Energize and proceed with testing or positioning; and
- Deenergize all systems and reapply energy control measures using procedures in this section to continue the servicing or maintenance.

15.10.1.9 **Group Lockout or Tagout.** When a crew, craft, department, or other group of employees performs servicing or maintenance, the procedure must provide the same level of protection as a personal LOTO device. Use group LOTO devices in accordance with procedures required by this section and FIST Volume 1-1 including, but not limited to, the following specific requirements:

- The primary authorized employee has the primary responsibility for employees working under the protection of a group LOTO device, and for
the device itself. The primary authorized employee must determine the exposure status of individual group members to the LOTO of the system;

- When using group lockout, each authorized employee must affix a personal lockout device to a group lockbox, or comparable mechanism before beginning work and must remove these devices when finished with their portion of the work; and

- When more than one crew, craft, or department, is involved, the written procedure must prescribe the assignment of overall job-associated LOTO control responsibility.

15.10.1.10 Shift or Crew Changes. Use specific procedures during shift or crew changes to ensure continuity of group LOTO protection. The program must describe a procedure to allow for information exchange to ensure the continuity of protection between outgoing and incoming personnel. The primary authorized employee accepting the transfer must physically verify the lockout points.

15.11 Communication Requirements

15.11.1 Notification of Personnel
The authorized employee must notify affected employees after LOTO devices have been placed or removed and before machines or equipment are started.

15.11.2 Application of Devices
LOTO devices must indicate who applied the device(s).

15.11.3 Warnings
Tagout devices must warn against hazardous conditions if the machine or equipment is energized and must include language such as: DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE, DO NOT OPERATE.

15.12 Definitions

Affected Person An employee whose job requires them to operate or use a system on which servicing, or maintenance is being performed under LOTO, or whose job requires them to work in an area where such servicing or maintenance is being performed.

Authorized Employee A trained employee who locks out or tags out machines or equipment to perform servicing or maintenance. An affected employee becomes an authorized employee when the employee’s duties include performing servicing or maintenance covered under this section.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Capable of Being Locked Out</td>
<td>An energy isolating device has a built-in lock, a hasp, or other means for affixing a lock. Other energy isolating devices are capable of being locked out if lockout can be achieved without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability (e.g., vendor devices which will make energy isolating device lockable).</td>
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<tr>
<td>Energized</td>
<td>Connected to an energy source or containing residual or stored energy.</td>
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<tr>
<td>Energy Isolating Device</td>
<td>A mechanical device that physically prevents the transmission or release of energy, including, but not limited to the following: manually operated circuit breakers, disconnect switches, slide gates, line valves, blocks, or similar devices capable of blocking or isolating energy. The term does not include push buttons, selector switches, and other control circuit type devices.</td>
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<tr>
<td>Energy Source</td>
<td>Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, nuclear, stored, or other energy.</td>
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<tr>
<td>Hot Tap</td>
<td>Work involving welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, to install connections or appurtenances. It is used to replace or add sections of pipeline without interrupting service for air, gas, water, steam, and petrochemical distribution systems.</td>
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<tr>
<td>Lockout</td>
<td>Placing a lockout device on an energy isolating device, in accordance with an established procedure, ensuring the energy isolating device and equipment being controlled cannot be operated until the lockout device is removed.</td>
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<tr>
<td>Lockout Device</td>
<td>A device that uses a positive means such as a physical lock, to hold an energy isolating device in the safe position and to prevent the energizing of a machine or equipment. Lockout devices include blank flanges and bolted slip blinds.</td>
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<tr>
<td>Servicing or Maintenance</td>
<td>Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining or servicing machines or equipment. These activities include lubricating, cleaning, or unjamming machines or equipment and adjusting or tool changes where the employee may be exposed to the unexpected energization or startup of equipment, or release of hazardous energy. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, nuclear, stored, or other energy.</td>
</tr>
<tr>
<td>Setting Up</td>
<td>Work to prepare a machine or equipment for normal production operation.</td>
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<tr>
<td>Special Work Permit</td>
<td>Form that formally documents the coordination between Reclamation and contractor personnel to authorize work by the contractor’s forces on or near Reclamation facilities when Hazardous Energy Control Procedures are required.</td>
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Tagout

Attaching a tag on an energy isolating device, in accordance with an established procedure, to indicate that employees must not operate the energy isolating device or the equipment until the tagout device is removed.

Tagout Device

A prominent visible warning device, such as a tag with a means of attachment, which can be securely fastened to an energy isolating device in accordance with established procedures, to indicate that employees must not operate the energy isolating device until the tagout device is removed.

15.13 References
