

Introduction

To comply with WAC 296-803, “Lockout/Tagout (Control of Hazardous Energy)”, to save lives and to reduce the risk to life and health of Eastern Washington University employees, the requirements set forth in this program shall be followed prior to the operation, servicing and maintenance of all machines, equipment and systems in which the startup or release of stored energy could cause injury.

This program applies to any person whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to be in an area potentially influenced by the servicing or maintenance being performed.

Written hazardous energy control procedures shall be established and used for each type of equipment with more than one source of energy. If no specific written procedures are available for the type of lockout or tagout planned, work cannot start until procedures are developed and approved by the authorized supervisor.

The forms of potentially hazardous energy sources located throughout Eastern Washington University (EWU) include but are not limited to:

- Electrical
- Natural gas
- Thermal (Steam)
- Hydraulic
- Mechanical
- Pneumatic
- Chemical
- Radiation
- Lasers

This program does not fully cover the protection of EWU employees from shock or flash hazards. Electrical safety for employees working on, near, or with energized electrical hazards between 50 volts and 600 volts is covered by the EWU High Voltage/Arc Flash Electrical Safety Program.

Objective

This program establishes the minimum requirements for lockout/tagout (LOTO) at EWU. The required safe practices outlined here shall be followed by each employee when working on or near machines or equipment where unexpected movement, energization or electrical systems, release of stored energy, or the flow of gases of fluid may have the potential to endanger personnel. When such conditions exist, precautions shall be taken to ensure that the energy is properly controlled and/or isolated from all potentially hazardous energy before servicing or maintenance activities begin.

Work Involving LOTO

Only qualified employees can perform LOTO and work that requires it. Employees must only lockout/tagout equipment they are responsible for. If more than one shop will be working on a piece of equipment, they will coordinate their LOTO procedures.

Building specific utilities can only be locked and tagged out by the specific responsible shop.

Academic departments are not to LOTO infrastructure equipment or supply lines (gas lines, building/classroom electrical breakers, steam lines, water lines, etc.).

Responsibilities

Environmental Health & Safety (EH&S) is responsible for:

- Providing general LOTO training and maintaining records of those trainings
- Maintaining an EWU LOTO Procedure Library
- Maintaining LOTO forms and providing them to departments/shops/groups as needed

- Identifying the shops that participate in this program and appropriate equipment
- Conducting periodic compliance checks of the LOTO and energy control procedures to ensure and the requirements of WAC 296-803 are being followed

Supervisors are responsible for:

- Reading and understanding the requirements of WAC 296-803
- Completing an *Equipment Inventory Form* (EIF) to identify the equipment/systems that their department/shop/group uses that requires lockout/tagout protocols
- Completing a *Lockout/Tagout Equipment Specific Procedure* (LOTO-ESP) for each equipment/system identified in the EIF
- Reviewing the EIF and all LOTO-ESPs annually to ensure they are complete and accurate
- Sending all LOTO-ESPs to EH&S for addition to the EWU LOTO Procedure Library
- Providing LOTO-ESPs to any EWU staff or contractors upon request
- Ensuring all employees have documented specific LOTO training for all machines, equipment, and systems they are expected to work on or around
- Conducting inspections of staff and completing periodic reviews of their work procedures to ensure compliance with LOTO program and WAC 296-803
 - Periodic reviews must happen at least annually
 - Any employee who performs tagout-only procedures must be reviewed one-on-one according to WAC 296-803-70015
- Filling out the *Abandoned Lock/Tag Removal Form* if an employee fails to remove their lock/tag and it must be removed for them
- Maintaining the following records:
 - Documentation of department/shop and equipment/system specific trainings
 - Copies of completed *Individual* and/or *Group Lockout/Tagout Procedure Worksheets*
 - Copy of program and employee inspections and reviews
 - LOTO lock and key assignments
 - EIF and LOTO-ESPs
- Determining a Lockout Coordinator for all activities requiring group LOTO

Lockout Coordinator is responsible for:

- Overseeing all work and workers in the group LOTO procedure
- Implement the energy control procedures and ensure that all members of the group are aware of the scope of the work and the hazards present
- Ensure all employees sign in and out of group LOTO jobs on the *Group Lockout/Tagout Procedure Worksheet*
- Ensuring all employees are accounted for before removing abandoned locks or tags
 - Completing and filing the *Abandoned Lock/Tag Removal Form* every time a lock/tag must be removed
- Perform a complete sweep of LOTO area before allowing energy to be restored

Employees are responsible for:

- Following all LOTO procedures
- Signing in and out of group LOTO areas
- Ensuring their lock(s) or tag(s) are included on group LOTO procedures at the start of the day and removing their lock(s) or tag(s) when their work is done
- Inspecting their area to ensure all energy has been locked out before working on group LOTO projects

General LOTO Procedure

There are six steps for locking out energy and six steps for reenergizing. They are:

Lockout

1. Prepare for shutdown
2. Shutdown equipment/system
3. Isolate equipment/system
4. Apply lockout/tagout devices
5. Control stored energy
6. Verify isolation of equipment/system

Reenergize

1. Remove all tools from work area and make sure loose parts have been removed or secured
2. Reapply all safeties
3. Alert affected employees that the equipment/system will be reenergized
4. Remove lockout/tagout devices
5. Restart the machine
6. Notify affected employees that the equipment/system is active

Lockout

1. Prepare for shutdown (before lockout)
 - Notify all employees in the affected area that LOTO is going to happen. If the locking out of equipment/system is not a regular occurrence, notify the department supervisor where the equipment is located. This may include notification to the Facilities Operations staff and other affected shop personnel.
 - Perform a survey to identify and physically locate hazardous energy sources and all isolating devices.
 - It is possible that the equipment/system will have more than one isolating device and hazardous energy source.
 - Reviewing drawings and equipment manuals may help identify all energy sources.
 - If you are unsure if you have located all energy sources and isolating devices, STOP and contact your supervisor for assistance.
 - Fill out the *Individual Lockout/Tagout Procedure Worksheet* for lockouts that:
 - Have more than one hazardous energy source
 - Use more than one energy-isolating device
 - Have potential stored or residual energy
 - Fill out the *Group Lockout/Tagout Procedure Worksheet* for lockouts that require more than one individual to complete.
2. Shutdown equipment
 - Shut down the equipment/system using normal stopping procedures (follow manufacturer directions).
3. Isolate equipment
 - Carefully isolate the equipment/system from each energy source feeding it, including stored and residual energy.
 - Identify and engage each energy-isolating device needed to control the energy to the system/equipment. Lockout/tagout devices need to be affixed in a manner that will hold the energy-isolating devices in a “safe” or “off” position.
 - Use the *Individual* or *Group Lockout/Tagout Procedure Worksheet* to ensure all energy sources have been isolated.

4. Apply lockout/tagout devices
 - Apply lockout devices, personal locks, and tags to appropriate isolating device(s). Each employee working on the equipment/system will place their lock and tag on the lockout device.
 - Group lockouts must follow the additional Group Lockout Procedures outlined in the Group Lockout section of this document.
 - Employees shall keep the key to their lock with them at all times while their lock is in use.
 - Equipment controllers, emergency switches and equipment interlocks must not be used or relied on for lockout purposes.
5. Control stored energy
 - Stored energy (e.g. electrical capacitors, compressed air, charged hydraulic systems, steam/hot water systems, and high pressure water) can pose the same hazards as live energy. When applicable:
 - Check that all moving parts have stopped
 - Installation of hot tap for servicing
 - Relieve, disconnect or restrain any residual energy that could be present
 - Relieve trapped pressure
 - Blank pipe flanges
 - Install ground wires to discharge electrical capacitors
 - Block or support elevated equipment
 - Verify isolation continually during service/maintenance if there is a possibility of re-accumulation of stored energy
6. Verify isolation of equipment
 - Attempt to start the equipment/system using normal operating procedures.
 - Make sure to return the controls to the **off** position after this test!!!
 - If equipment/system starts, discontinue the procedure immediately and contact your supervisor or the Lockout Coordinator.

Reenergize

1. Remove all tools from work area and make sure loose parts have been removed or secured.
 - Perform a thorough sweep of the work area to make sure nothing was left behind or unattached. Tools left on or around equipment can damage the equipment/system or fly off and create hazards.
 - Remove, blank, or turn off any installed hot taps.
2. Reapply all safety features.
 - Ensure any safety features that were disabled or removed for work are returned to their original condition.
3. Alert affected employees that the machine will be reenergized.
 - Make sure everyone knows that the equipment/system will be turned on soon, make sure all personnel are in safe locations.
4. Remove lockout/tagout devices.
 - Each person must remove their own lock(s) and/or tag(s).
5. Restart the machine.
 - Follow manufacturer directions to safely restart equipment and machinery.
6. Notify affected employees that the equipment/system is active.
 - Make sure everyone in the affected area is aware that the equipment/system is operational.

Reenergizing steps should be followed anytime the equipment/system needs to be restarted, even temporary restarts during servicing and maintenance must follow these steps. If the restart is temporary, all the lockout steps except the survey must be completely repeated following the restart.

Multi-Day LOTO Procedures

If equipment/system(s) need to be locked out for more than one day:

- Employees must log their activities at the Facilities Operation desk and notify their supervisor or Lockout Coordinator that they are leaving the equipment/system locked out overnight.
- Affected employees should also be notified that the equipment/system will remain locked out overnight.

Group LOTO Procedures

Anytime LOTO involves more than one person, a single authorized employee must assume the role of Lockout Coordinator. The Lockout Coordinator must be familiar with the type(s) and magnitude of the energy that may be present during the servicing and maintenance work. The *Group Lockout/Tagout Procedure Worksheet* must be used anytime a group lockout is performed.

The Lockout Coordinator and at least one other member of the group must perform each LOTO step.

- If contractors are involved in the group LOTO, at least one contractor must also be present for each LOTO step.

Locks and/or tags must be applied by each member of the group. There are two options for group locking/tagging:

1. Each area locked out or tagged out can have a lock or tag for each individual in the group.
2. Each area locked out can have a single lock. The key(s) for the lock(s) are placed into a box or cabinet and each individual in the group applies their lock to the box/cabinet.

In either case the Lockout Coordinator should be the last person to remove his/her lock at the end of the project.

Entering/Leaving Group LOTO Areas

Each individual must:

1. Sign in on the *Group Lockout/Tagout Procedure Worksheet*
2. Apply their lock(s)/tag(s) to the each locked out or tagged out area or to the lockout box/cabinet
3. Review the LOTO protocol for their section to ensure deactivation is complete
4. Remove their lock(s)/tag(s) and sign-out when leaving the job site

Abandoned Locks/Tags

In the event that a lock/tag is not removed and the equipment/system must be reactivated before the employee will return to work:

- The supervisor or Lockout Coordinator must fill out an *Abandoned Lock/Tag Removal Form* and attempt to contact the employee.
- **If the employee can be contacted** to confirm that the lock/tag was forgotten, the Lockout Coordinator or supervisor may remove the lock and restart the equipment/system following the Reenergize protocol.
- **If the employee cannot be contacted**, the Lockout Coordinator or supervisor must perform a complete sweep of the affected work area to ensure the employee is not present. If the employee is not located the Lockout Coordinator or supervisor may remove the lock and restart the equipment/system following the Reenergize protocol.
- The Lockout Coordinator or supervisor must inform the employee that their lock was removed and have them sign the *Abandoned Lock/Tag Removal Form* before the employee can resume work.
- A copy of the *Abandoned Lock/Tag Removal Form* must be submitted to the Facilities Manager.

Tagout-Only Procedures

It is recommended that all procedures be completed using lockout methods. Tags may be used alone only when lockout is not possible. Written permission for tagout-only procedures is required from the Facilities Operation Manager or their designee. Fill out a *Tagout-Only Justification Form* and submit it to the Facilities Operation Manager to obtain permission for any tagout-only procedure.

According to WAC 296-803, each employee using tagout-only procedures must be periodically reviewed one-on-one.

When using tagout-only, all LOTO procedures must be followed and:

- Each worker must apply their own tag to the equipment/system to be tagged out
- Each tag must have the date, time, name of tagger, and reason for tagging on it.

Tag Limitations

Employees using tagout-only must know:

- Tags are only warning notes affixed to energy isolating devices, they provide no physical restraint to prevent someone from activating the equipment/system.
- When a tag is attached to an energy isolating means, it should not be removed by anyone but the named individual. It should not be bypassed, ignored, or otherwise defeated.
- Tags must be legible and understandable by all employees in the affected area in order to be effective.
- Tags and their means of attachment must be made of materials which will withstand the environmental conditions in the work area.
- Tags must be securely attached to energy isolating devices so they cannot be inadvertently or accidentally detached.

Protective Material and Hardware

All hardware necessary for isolating, securing, or blocking equipment/systems from energy sources shall be supplied by the employee's department/shop.

This hardware may include:

- Locks
- Tags
- Chains
- Wedges
- Key blocks
- Adapter pins
- Self-locking fasteners

LOTO devices shall be tagged or colored so that the individual or department responsible can be identified. Devices can only be used for controlling energy and must not be used for other purposes. All devices must meet the requirements of WAC 296-803-400.

Department	Color
Building Maintenance	Blue
EH&S	Silver metal
Electric	Red
Fabrication	Black
HVAC	Green
Insulation	White
Plumbing	Yellow
Power Plant	Bronze
Science	Grey
Technology	Purple
Telephone/OIT	Orange

Contractors, Vendors, and Others

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of WAC 296-803, EWU and the outside employer shall inform each other of their respective LOTO procedures.

The outside employer shall ensure that all outside personnel shall comply with all requirements of the EWU LOTO control program.

Contractors on Group Lockouts

When the group lockout will include work performed by contractors, a designated person from each contractor must accompany the Lockout Coordinator during Lockout. The designated person must, at a minimum, observe and review each step of the Lockout protocol.

Contractors must:

- Sign-in and out of the job on the EWU Lockout Procedures and Checklist form
- Apply a personal lockout device on the box/cabinet/lockout device before they enter the job
- Remove their lockout device when they leave

Definitions

Affected Employee: An employee whose job requires them to operate equipment on which servicing or maintenance is being performed under LOTO conditions or whose job requires them to work in an area where servicing or maintenance is being performed.

Authorized Employee: An employee who is trained and capable to lockout or tagout equipment in order to perform service or maintenance activities.

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

Energy-Isolating Device: A mechanical device when physically prevents the transmission of energy. Examples include, but are not limited to, circuit breakers, manually operated disconnect switches, slide gates, slip gates, slip blinds, line valves, blocks or similar devices with visible indication of the devices' position. Push buttons, selector switches and other controls are not energy isolating devices.

Energy Source: Any electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy (including gravity) that could cause injury to employees.

Group Lockout: A LOTO job involving more than one employee.

Hot Tap: A procedure used in maintenance and service activities that involves cutting and/or welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without interruption of service for air, gas water, steam, and chemical distribution systems.

Lock Box: A box that can be locked out. Lock boxes are used with group lockouts or multiple point lockouts.

Lockout Device: A device requiring the use of a lock and key to hold an energy-isolating device in the deactivated position. These include, but are not limited to, electrical plug caps, valve handle chains or covers, lockout hasps, and circuit breaker and ball valve lockouts.

Locked-Out Condition: All energy sources to equipment are isolated and controlled through the application of locks, blinds, blocking, and the dissipation of stored energy.

Multiple Point Lockout: Equipment/systems having more than one energy source and/or more than one lockout point. They require the application of multiple lockout devices to achieve a locked-out condition.

Qualified Person: An employee trained on how to apply LOTO properly to all equipment they are expected to work on. They must be trained on the contents of this program, and how this programs is applied specifically to their department's equipment.

Single Point Lockout: Equipment requiring the application of a single lockout device to achieve a locked-out condition.

Tagout Device: A tag placed on a locked-out energy-isolating device to identify the authorized employees and to communicate that the equipment is in a locked-out condition.

REVISION HISTORY		
Rev	Affected Page	Change Descriptions
0	All	Release 07/2/1992
1	All	Reformat, Remove Links 004/01/1999
2	All	Reformat, Remove Links, Chang to WAC 296-803
3	All	Reformat, add history, major additions to P1-P10, added form notation
4	All	Reformat header and footer
5	All	Reviewed 4/15/16
6	P8	Added EH&S lock Color. Added Equipment specific procedure and equipment inventory forms and information. 10/11/16
7	All	Reformatted, Reorganized, Edited, Added information on reenergizing equipment and updated forms – 2/8/2017

Associated Forms

All forms are located on the EH&S website (sites.ewu.edu/ehs)

- Abandoned Lock/Tag Removal Form
- Equipment Inventory Form
- Group Lockout/Tagout Procedure Worksheet
- Individual Lockout/Tagout Procedure Worksheet
- Lockout/Tagout Equipment Specific Procedure
- Lockout/Tagout Periodic Inspection Worksheet
- Tagout-Only Justification Worksheet
- Training Documentation Form