

Lockout/Tagout Program: Control of Hazardous Energy

I. Purpose

The purpose of the Lockout/Tagout program is to protect Montana Tech employees and students from injury or death from the release of hazardous energy. This program establishes the minimum requirements for isolation of electrical, chemical, thermal, hydraulic, pneumatic, and gravitational energy prior to equipment repair, adjustment or removal. Reference: OSHA Standard 29 CFR 1910.147, the control of hazardous energy.

II. Responsibilities

The Physical Facilities Director has ultimate responsibility for the Lockout/Tagout Program for Physical Facilities Employees, and faculty members who utilize lockout/tagout have responsibility for ensuring the program is followed. The Director/Faculty member must:

- Ensure compliance with all hazardous energy-control procedures.
- Provide the necessary devices to lockout or tagout energy-isolating devices

Employees or students who utilize lockout/tagout must:

- Be familiar with the purpose and use of lockout/tagout procedures and will be responsible for ensuring they do not attempt to restart or reenergize machines or equipment that are locked out or tagged out
- Be able to recognize and control hazardous energy sources and implement established lockout or tagout procedures

III. General Lockout/Tagout Procedures

Before working on, repairing, adjusting or replacing equipment and machinery, all appropriate safety procedures, including lockout/tagout, must be utilized to place the machinery or equipment in a neutral or zero mechanical state. See Appendix A for standard operating procedures.

When the energy-isolating device is not lockable, a tagout system may be used, provided the level of safety is equivalent to the level of safety using a lockout system. See Appendix B for procedures.

Montana Tech must supply the lockout and tagout devices required.

See Appendix C for exceptions to the lockout/tagout procedures.

See Appendix D for lockout/tagout procedures for the boilers at Montana Tech.

IV. Management's Removal of Lock and Tag

Only the employee who applied the lock and tag may remove his/her lock and tag. However, should the employee leave the facility before removing the lock and tag, the lock may be removed by using bolt cutters or other equivalent means under the direction of the Physical Facilities Director or the Assistant Director as required in 29 CFR 1910.147(e)(3). The Director must be assured that the employee who applied the lock and tag is not at the facility and is notified that the lockout/tagout devices have been removed, that all tools have been removed from the area, all guards have been replaced, and all employees are clear of the area before the lock and tag are removed and the equipment is returned to service.

V. Contractors

Contractors working on the Montana Tech campus must use this lockout/tagout procedure while servicing or maintaining equipment, machinery or processes.

VI. Inspection

Montana Tech will conduct an inspection at least annually of the energy control procedures to ensure that the procedure and the requirements of this standard are being followed.

VII. Training

All Montana Tech employees or students who are required to utilize lockout/tagout procedures will be trained in the procedures when initially hired and as required by changes in equipment or technology. All training will be documented.

Training will include:

- Recognition of applicable hazardous energy sources
- The type and magnitude of energy available in the workplace
- Methods and means necessary for energy isolation and control
- The limitations of using tagout system only

Updated December 2015

Appendix A

Lockout/Tagout Standard Operating Procedures

All authorized employees who perform lockout/tagout must follow this sequence:

1. Prepare for shutdown. Know what type of energy the machine uses. Identify potential hazards. Find the switches, valves or other devices that control energy and need to be locked out.
2. Let affected employees know you'll be locking or tagging out the equipment and why.
3. Turn off the machine or equipment.
4. Locate and isolate all energy sources. Get rid of any stored energy, as in springs, hydraulic systems, or air pressure. You may have to block, bleed, vent, etc. to be sure there's nothing left to move a machine part.
5. Lock out the switches or other energy controls. Attach your lock to hold the switches in an "off" or "safe" position. Also apply tag to identify who is working on the equipment and to warn others that the switch is locked out.
6. Test the operating controls. Be sure no one is close enough to get hurt. Put all controls in the "on" position. Make sure the power doesn't go on and that the equipment won't operate.
7. Put operating controls back in the "off" or "safe" position.
8. Test the circuits and electrical parts of the equipment to be sure they are de-energized.
9. Perform necessary service or maintenance.

CAUTION: If you need energy to test or position the equipment during maintenance or repair, follow all the lockout removal steps before you turn energy on. And follow all lockout steps to turn off the power and protect yourself before you begin work again.

Restore the equipment back to service using the following steps.

1. Check the machine or equipment and the immediate area around the equipment to ensure that all tools and other items have been removed and that the equipment components are operationally intact.
2. Check the work area to be sure that all employees have been safely positioned or removed from the area.
3. Verify that the controls are still in the "off" or "safe" position.
4. Remove the lockout and tagout devices and re-energize the equipment.
 - The lockout and tagout devices must be removed only by the person who put them on.
 - If servicing lasts more than one work shift, the outgoing and incoming workers will together remove the outgoing worker's lock and install the new worker's lock.
5. Notify the affected employees that the servicing or maintenance is completed and the equipment is ready for use.

Appendix B

Tagout Procedures

Tagout devices warn against hazardous conditions if the machine or equipment is energized, and must contain a legend such as *Do Not Start*, *Do Not Open*, *Do Not Close*, *Do Not Energize*, *Do Not Operate*.

If an energy-isolating device is not capable of being locked out, Montana Tech, in using a tagout system, must still provide the same level of protection as when using lockout procedures.

The following are limitations and guidelines for using only a tagout system:

- Tags are essentially warning devices and do not provide the physical restraint that is provided by a lock.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- Tags cannot be removed except by the person who applied it, and it is never to 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 or may be in the area.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Where tagout is used for energy control, the periodic inspection must include a review between the inspector and each authorized and affected employee of that employee's responsibilities under the energy control procedure being inspected.

Appendix C

Exceptions to Lockout/Tagout

The following tasks do not require lockout or tagout procedures:

- Work on cord and plug-connected electric equipment for which exposure to the hazards of unexpected energization or start-up of the equipment is controlled by unplugging the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that
 - Continuity of service is essential;
 - Shutdown of the system is impractical; and
 - Documented procedures are followed, and special equipment is used that will provide proven, effective protection for employees.

Appendix D

Lockout Procedures Montana Tech Boiler Room

I. Purpose and Scope

This procedure establishes the requirements for the lockout of all energy sources for the boilers located in the boiler room at Montana Tech. These procedures must be used to ensure that all energy sources are isolated and locked out before employees perform any servicing or maintenance activities on the boilers.

II. Authorization

This procedure is in compliance with OSHA's lockout/tagout requirements, 29 CFR 1910.147.

III. Responsibility

The Physical Facilities boilermen must be trained in the proper procedures for the shutdown of the boilers. This training shall include recognition of applicable hazardous energy sources, type and magnitude of the energy, and the methods for energy isolation and control.

IV. Procedures for Shutting Down the Boilers

1. Turn off boiler at the control panel.
2. Turn off control power on control panel.
3. Turn off power at main breaker panel.
4. Lock out the control panel and main breaker panel.
5. Shut off main gas valve and lock with the provided chain and keyed lock.
6. Close pilot light valve.
7. After boiler has stopped generating steam, close main header valve and lock the chain.
8. Lock blow down line in closed position with provided chain and lock.
9. Switch feed water pump off to boiler.
10. Close feed water valve.
11. Open atmospheric valve on main steam header valve

V. Testing Locked Equipment before Beginning Maintenance

1. Attempt to start the equipment with the standard start up procedures to be certain the energy source is dead.
2. Test electrical components with a voltage type tester to check for stored energy.
3. Check pressure gauges for any pressure.
4. On steam and water lines, open a bleed-off valve to make sure all pressure has been released.

VI. Boiler Maintenance

1. Follow all procedures listed above for shutting down the boilers.
2. Lock out breakers to the equipment that is to be worked on.
3. If a shift change is involved:
 - Each person leaving must remove his lock, and the new person coming on shift must put his own lock in place,
 - If they will finish the job at a later date, their locks must remain in place until the completion of the job or until the job is turned over to other personnel.
 - No locks may be removed by anyone other than the person who placed the lock without written authorization from the Assistant Director of Physical Facilities. The Assistant Director of Physical Facilities must verify in writing that he has checked the area and made certain no person or equipment could be harmed by removing the lock and reactivating the equipment.

VII. Boiler Repair

At times when repair work must be done while the system is under pressure, only the electrical systems shall be worked on until the pressure has been released so the pumps and piping may be safely closed, locked and tagged