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Lockout/Tagout: Control of Hazardous Energy Program

I. Purpose

The intent if 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. The program defines the requirements for lockout/tagout as required by Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.147.

II. Responsibilities

The Physical Facilities Director has responsibility for the Lockout/Tagout Program for Physical Facilities employees.

Faculty utilizing the Lockout/Tagout Program has 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, use of lockout/tagout procedures, and do not attempt to restart or reenergize machines or equipment that are locked or tagged out.
- Be able to recognize and control hazardous energy sources, and implement lockout or tagout procedures.

III. General Lockout/Tagout Procedures

Before working on, repairing, adjusting or replacing equipment and machinery, all appropriate lockout/tagout procedures, 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. See Appendix C for exceptions to the lockout/tagout procedures. See Appendix D for lockout/tagout procedures for the boilers at Montana Tech. See Appendix E for lockout/tagout procedures for single energy source and multi energy source forms.

Montana Tech must supply the lockout and tagout devices required.

IV. Management's Removal of Lock and Tag

Only the employee who applied the lock and tag may remove the lock and/or tag. However, should the employee leave the facility before removing the lock and/or 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 the employee who applied the lock and/or tag is not at the facility and is notified the lockout/tagout devices have been removed. The machine or equipment must be returned to safe working conditions before it is restarted.

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 period inspections of the energy control procedures to ensure the procedure and the requirements of this standard are being followed.

VII. Training

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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 the following:

- 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, and
- The limitations of using tagout system only.

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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 main power switch that will isolate the energy.
2. Inform affected employees the machine will be locked and/or tagged out and reason 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. Blocking, bleeding, venting, etc. may have to occur to ensure nothing is left to move a machine part.
5. Lock out the switches or other energy controls. Attach a 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 the switch is locked out.
6. Test the operating controls. Be sure no individuals are close to prevent injury if failure occurs. Put all controls in the "on" position. Make sure the power doesn't go on and 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 ensure the equipment is de-energized.
9. Perform necessary service or maintenance.

CAUTION: If testing or positioning the equipment is required during maintenance or repair, follow the lockout removal steps before energy is turned on.

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 tools and other items have been removed. Ensure the equipment components are operationally intact.
2. Check the work area to verify employees have been safely positioned or removed from the area.
3. Verify the controls are in the "off" of "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 worker's personal lock will be removed by that employee and the incoming employee will install a personal lock.
5. Notify the affected employees 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, is 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 a lock does.
- Tags may evoke a false sense of security.
- Tags cannot be removed except by the person who applied it. 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 in the area.
- Tags must be securely attached to energy isolating devices to prevent inadvertently or accidentally detachment during use.

Where tagout is used for energy control, the periodic inspection must include a review between the inspector, the authorized, and affected employees to ensure responsibilities of each party is understood under the energy control procedure.

Appendix C: Exceptions to Lockout/Tagout

The following tasks do not require lockout or tagout procedures:

- Working on a cord and/or plug-connected electric equipment that is controlled by unplugging the equipment. While the plug is under the exclusive control of the employee no lockout/tagout device is required during the servicing or maintenance.
- Hot tap operations involving transmission and distribution for substances such as gas, steam, or water of petroleum products on pressurized pipelines. The employer must demonstrate the following:
    - continuity of service is essential;
    - shutdown of the system is impractical; and
    - documented procedures are followed. Special equipment may need to be implemented to provide effective protection for employees.

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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 all energy sources are isolated and locked out before employees perform any servicing or maintenance activities on the boilers.

II. Authorization

This procedure follows 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. The 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 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 employee leaving must remove the personal lock, and the new employee coming on shift must put a personal lock in place,
   - If the job will be completed at a later date, the 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. The Physical Facilities Director has the authority to remove a personal lock of an employees as long as written verification of the area is clear, no personal could be harmed, or equipment could be damaged 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.

Appendix E – Lockout/tagout Procedures Forms

Forms on following pages.

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Lockout/Tagout Procedure

Single-Energy Source

Created by:	Reviewed by:	Approved by:
Department:	Building:	Room:
Equipment Description:		
Required PPE:		

Isolating Device	Location of Device	Energy Type	Magnitude	Energy Control Procedure

***Test to confirm the above is locked out – try starting**

Equipment Notes:

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Lockout/Tagout Procedure

Multi-Energy Source

Created by:	Reviewed by:	Approved by:
Department:	Building:	Room:
Equipment Description:		
Required PPE:		

Sequence	Isolating Device	Location of Device	Energy Type	Magnitude	Energy Control Procedure
1					
2					
3					
4					
5					

***Test to confirm the above is locked out – try starting**

Equipment Notes: