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Purpose

Portland State University’s (PSU) Lockout/Tagout Program protects employees and contractors who must do service or maintenance on any machines or equipment who could be injured by an unexpected start-up or release of a hazardous energy. Service or maintenance includes erecting, installing, constructing, repairing, adjusting, inspecting, unjamming, setting up, trouble-shooting, testing, cleaning, and dismantling machines, equipment or processes.

This Program ensures that machinery or equipment is stopped, isolated from all hazardous energy sources, and properly locked or tagged out.

Regulatory Standards

The OR-OSHA Control of Hazardous Energies (Lockout/Tagout) Standard (OR-437 Div. 2/J. 1910.147) requires the employer to develop, implement and enforce a hazardous energies control program that includes:

- Written energy-control procedures
- Lockout/tagout devices and hardware
- Inspections of energy-control procedures at least annually
- Effective employee training program

Scope

This program applies to all PSU employees and contractors hired who may be exposed to a hazardous energy during service or maintenance work. Uncontrolled hazardous energies include potential, kinetic, flammable, chemical, electrical, and thermal sources.

Some normal production operations are also covered by this standard under “Special lockout/tagout Situations.”

Employer and employee responsibilities

PSU’s Environmental Health and Safety (EHS) department is responsible for implementing and enforcing this Program and for providing required training.

Supervisors and Project Managers must enforce the use of lockout and/or tagout devices when employees or contractors do service or maintenance work and may be exposed to a hazardous energy.

All PSU employees and contractors who do service or maintenance work and/or work in areas where lockout/tagout procedures are used must:
• comply with this Program, at a minimum;
• follow the lockout/tagout procedures described in this Program;
• understand the purpose of the Program; and
• be prohibited from attempting to restart machines or equipment that are locked or tagged out

Definitions

**Affected employee**: A person who uses equipment or machinery that is being serviced under lockout or tagout procedures as well as working in an area where equipment or machinery is being serviced.

**Authorized employee**: A person who locks out or tags out equipment/machinery to do service or maintenance work. An affected employee becomes an authorized employee when that employee’s duties include service or maintenance work on equipment/machinery.

**Capable of being locked out**: An energy-isolating device that is designed with a hasp or other means of attachment to which, or through which a lock can be affixed, or it has a locking mechanism built into it. Other energy-isolating devices will also be considered to be capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently altering its’ energy-control capability.

**Contractor(s)**: Outside companies hired by PSU to do maintenance or service work and who are or may be exposed to hazardous energies.

**Disconnect**: A switch that disconnects an electrical circuit or load (motor, transformer, or panel) from the conductors that supply power to it. An open circuit does not allow electrical current to flow. Under a lockout procedure the disconnect must be capable of being locked in the open position.

**Energized**: Connected to an energy source or containing potential energy.

**Energy source**: Any source of energy. Examples: potential, electrical, mechanical, hydraulic, pneumatic, chemical, and thermal.

**Energy-isolating device**: A mechanical device that physically prevents transmission or release of energy.

**Hazardous energy**: Any of the types of energy existing at a level or quantity that could be harmful to workers or cause injury through inadvertent release or start-up of equipment.

**Lockout device**: A device that locks an energy-isolating device in the safe (off) position.
**Lockout:** Placing a lockout device on an energy-isolating device, under an established procedure, to ensure the energy-isolating device and the equipment/machinery it controls can't be operated until the lockout device is removed. (An energy-isolating device is capable of being locked out if it has a hasp that accepts a lock or if it has a locking mechanism built into it.)

**Procedure:** A series of steps taken to isolate energy and shut down equipment.

**Servicing or maintenance:** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining machines or equipment. Also includes lubricating, cleaning, unjamming, and making adjustments or tool changes if a worker may be exposed to the unexpected startup of the equipment during such activities.

**Tagout device:** A prominent warning sign, such as a tag, that can be securely fastened to an energy-isolating device to indicate that the energy-isolating device and the equipment it controls can't be operated until the tagout device is removed.

**Tagout:** Placing a tagout device on an energy-isolating device, under an established procedure, to indicate that the energy-isolating device and the equipment it controls can't be operated until the tagout device is removed.

**Lockout and tagout devices**

Lockout and tagout devices **must** meet the following criteria to ensure that they are effective and not removed inadvertently:

- Lockout devices **must** work under the environmental conditions in which they are used. Tagout device warnings must remain legible even when they are used in wet, damp, or corrosive conditions.

- Lockout and tagout devices **must** be designated by color, shape, or size. Tagout devices must have a standardized print and warning format.

- Lockout devices and tagout devices **must** be strong enough that they can't be removed inadvertently. Tagout devices must be attached with a single-use, self-locking material such as a nylon cable tie.

- Any employee or contractor who sees a lockout or tagout device **must** be able to recognize who attached it and its purpose.

- Each lock **must** have a unique key or combination.

Energy-isolating devices are the primary means for protecting PSU employees and their contractors who maintain or service equipment, and machinery **must** be designed to accept a lockout device.

**Electrical energy sources:** Lockout or tagout of electrical energy sources must occur at the circuit disconnect switch. Electrical control circuitry does not effectively isolate hazardous energy. See also, **Alternative methods.**
Exposure survey

The PSU EHS Department, with the help of each department involved, will conduct a hazardous energy survey to determine affected machines and equipment, types and magnitude of energy, and necessary service and maintenance tasks. Each task will be evaluated to determine if it must be accomplished with lockout or tagout procedures.

Energy control procedures

Authorized employees and contractors who lockout or tagout equipment when doing service or maintenance work, must follow the specific written energy-control procedures for said equipment. The procedures must include the following information:

- The intended use of the procedure
- Steps for shutting down, isolating, blocking, and securing equipment or machinery
- Steps for placing, removing, and transferring lockout devices
- Equipment-testing requirements to verify the effectiveness of the energy-control procedures

Employees and contractors must do the following before beginning service or maintenance work:

1. Inform all affected employees of equipment shutdown.
2. Shut down equipment.
3. Isolate or block all hazardous energies.
4. Remove/release any potential (stored) energy.
5. Lockout or tagout all energy sources.
6. Verify the equipment is isolated from all hazardous energies then de-energized.

Employees and contractors must do the following before removing lockout or tagout devices then re-energizing equipment:

1. Remove tools and replace machine or equipment components.
2. Inform ALL coworkers about energy-control device removal.
3. Ensure all workers are clear of the work area.
4. Verify machine or equipment power controls are off or in a neutral position.
5. Remove the lockout or tagout device.
6. Re-energize equipment.
Employees and contractors must do the following before performing any energized testing:

When re-energizing equipment is necessary — when power is needed to test or position the equipment, for example — temporary removal of lockout or tagout devices is allowed. This applies only for the time required to perform the task and this procedure below MUST be followed.

When an energy-isolating device is locked or tagged out and it becomes necessary to test or re-position equipment, the following must be done:

1. Remove unnecessary tools and materials.
2. Ensure that all other employees are out of the machine/equipment area.
3. Remove locks or tags from energy isolating devices.
4. Proceed with test.
5. De-energize equipment and lockout or tagout energy-isolating devices.
6. Operate equipment controls to verify that the equipment is de-energized.

Specific energy-control procedures

PSU has developed specific energy-isolation procedures for all machines and equipment that have energy-isolating devices and are required to be maintained or serviced.

Procedures will be available in the EHS department, additionally in binders maintained in the systems office and/or where feasible procedures will be posted on or next to the equipment itself.

Special lockout/tagout situations

Contract service and maintenance

PSU and its contractors must be aware of their respective lockout/tagout procedures before the contractor does onsite work. PSU employees must understand and comply with the contractor’s energy-control procedures (if it is deemed more stringent than PSU’s); otherwise the PSU LO/TO Program will be followed by all involved.

Group lockout

When servicing and/or performing maintenance by a crew, craft, department, or other group (including contractors), they shall utilize a procedure that affords all employees involved a level of protection equivalent to that provided by the implementation of a personal lockout/tagout procedure.

Group lockout/tagout devices shall be used in accordance with the procedure requiring for single lockout/tagout protection, which affords the employees a level of equivalent protection provided by the implementation of a personal lockout or tagout device, mentioned earlier in this program.
Primary responsibility for a set number of employees working under the protection of a group lockout or tagout device must be vested in a single authorized employee. The single authorized employee must determine the exposure status of individual group members.

If there will be more than one crew, department, or group involved in the activity, a single authorized employee must be designated to coordinate affected workforces and to ensure continuity of protection.

Each authorized employee must affix a personal lockout or tagout device to a group lockout device, group lockbox or comparable mechanism when he/she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

**Shift changes and long-term shutdowns**

PSU will utilize specific procedures during shift and personal changes to ensure the continuity of lockout/tagout protection, including the orderly transfer of lockout/tagout devices protection between the off-going and on-coming employees.

EHS, along with the Departmental Supervisor involved will be responsible for monitoring lockout and tagout devices that control the energy to equipment during long-term shutdowns.

**Alternative methods**

When lockout or tagout is *not* used for tasks that are routine, repetitive, and integral to the production process, or prohibits the completion of those tasks, then an alternative method *must* be used to control hazardous energy.

Selection of an alternative control method must be based on a risk assessment of the machine, equipment, or process. The risk assessment must consider existing safeguards provided with the machine, equipment or process that may need to be removed or modified to perform a given task.

For example, when control circuits are used as part of the safeguarding system, the system must be designed to ensure protection as effective as a mechanical disconnect switch or master shut-off valve. A control-reliable dual channel hardwired circuit of industrially-rated components that satisfies the design features as specified in ANSI B11.19, with a safety relay or safety PLC to ensure integrity and performance of the safeguarding system, must be used.

Under all circumstances, the individual must have exclusive personal control over the means to maintain the state of the control circuit in a protective mode.

**NOTE:** EHS must review all proposed Alternative methods prior to being work.
Training

All employees who may be exposed to any hazardous energy will receive annual training on the PSU Lockout/Tagout program. Refresher training will be held annually or when there is an incident due to non-compliance of the policy or if the policy itself is changed or updated. The training will ensure that all employees understand PSU’s energy-control policy and have the appropriate skills to apply, use, and remove energy controls. The training will include the requirements of 29CFR 1910.147 (OAR 437 Div. 2/J) and the following:

- **Affected employees** will be trained in the purpose and use of energy-control procedures.
- **Authorized employees** will be trained to recognize hazardous energy sources, the type and magnitude of these sources in the workplace, the methods and means necessary for isolating and controlling the energy, and the means to verify that the energy is controlled, de-energized.
- **Employees** whose jobs are in areas where energy-control procedures are used will be trained about the procedures and the prohibition against starting machines that are locked or tagged out.
- **Employees must** be retrained annually to ensure they understand the energy-control program and procedures and to comply with OR-OSHA training regulations.
- **Authorized and affected employees** will be retrained whenever their job assignments change, the energy-control procedures change, equipment or work processes present new hazards, or when the employee doesn’t follow energy-control procedures.

Current training records will be maintained for each employee that received the training and will include the employee’s name, PSU ID# and the training date.

**Inspections of written energy-control procedures**

Portland State University EHS will assist with the performance and documentation of annual inspections of the energy-control procedures to ensure that ALL employees understand and use them correctly. Documentation will include the following:

- The equipment and building location for which the procedure is used.
- The date of the inspection.
- The employees included in the inspection.
- The inspector’s name.

If an inspector finds that employees are not following an energy-control procedure or that the current procedure is not protecting efficiently, either the employees must be retrained and/or the procedure’s deficiencies must be corrected immediately.
The inspector must understand the procedure and must be someone other than those following the procedure at the time of the inspection. Each procedure’s accuracy, completeness, and effectiveness must be verified.

If the inspection covers a procedure for equipment with an energy-isolating device that can be locked out, the inspector must review the procedure with the employees who use it to service the equipment. The inspector can review the procedure with the employees individually or in a group.

If the inspection covers a procedure for equipment with an energy-isolating device that can only be tagged out, the inspector must review the procedure with the authorized employees who service the equipment and with affected employees who may work in the area when the equipment is serviced. The inspector can review the procedure with the employees individually or in a group.

**Special Circumstances for Emergency Lock Removal**

In case of an emergency, when the employee who placed a lockout device on a machinery/system cannot come back to the campus or no longer works for PSU, only the individual’s immediate supervisor (or appointed representative) can remove the lock. In doing so the supervisor (or appointed representative) must contact EHS and complete Appendix A – Emergency Lockout Removal Form.

**Additional Information**

Contact EHS for questions regarding Lockout Tagout and controlling hazardous energy. The Program Administrator for the Lockout Tagout Program is Jill Jones.
Lockout/Tagout- APPENDIX A
Emergency Lockout Removal Form

Date Created: 10/13/2014  Date Revised:  Reviewed By: EHS Staff

For additional information and assistance regarding this form, please contact Environmental Health and Safety at (503) 725-3738.

**EMERGENCY: Lockout/Tagout Removal:**

1. In the case where a lockout device must urgently be removed, and the individual who owns the attached device cannot be found or cannot return to campus to remove it; OR

2. If the individual is no longer employed by PSU; THEN

The worker's Immediate Supervisor (or appointed representative) CAN remove the lock after signing this document with a witness from the EHS Department.

Circle 1. or 2. above, as applicable.

**Location of Lock/Tag:** ________________________________

____________________________________________________

Supervisor: _________________________________________

Witness: ____________________________________________

Date: __________________________

Forward a copy to EHS Department, ATTN: Jill Jones.

File the original in your records and maintain for 3 years per OR-OSHA and PSU Lockout/Tagout Program.