Portland Community College Health & Safety Manual	**Department: Environmental Health & Safety (EH&S)**	
	Function: Facilities Management Services	
	Topic: Chapter 10 - Control of Hazardous Energy and Lockout / Tagout	
	Board Policy: B507 **Effective Date: May 2004**	**Revised Date:** **December 2019**

Authority	PCC Board Policy - B507 Portland Community College is committed to providing a safe and healthy work and educational environment for its employees, students and visitors**.**

Summary	These procedures will be used to protect the health of employees, reduce accidental injury, and reduce hazards associated with hazardous energy. PCC's intent is to control hazardous energy by means of lockout and/or tagout to make the work site safe for its employees. Employees are to be aware of the hazards associated with the hazardous energy, and the safe practices of lockout and tagout necessary to safely handle hazardous energies.

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I. PURPOSE

The primary objective of the lockout/tagout plan is to provide the maximum protection of PCC's employees whenever they must isolate energy sources to service machines, equipment, and systems, and to prevent unexpected energization, start-up, or release of stored energy that could cause them injury.

The second objective is to prevent property damage by ensuring that machinery and/or equipment is stopped, isolated from all hazardous energy sources, and properly locked or tagged out prior to conducting work.

This plan applies to all PCC employees and contractors working on PCC property who may be exposed to hazardous energy sources during service or maintenance work. Hazardous energy is comprised of two forms, either potential or kinetic. Potential is stored energy that can be drawn upon to do work. Kinetic is energy resulting from moving objects, such as released loads, uncoiling springs, and moving machinery.

This procedure is also to ensure compliance with Federal OSHA and Oregon (OR) OSHA regulations dealing with hazardous energy sources according to OAR 437 Division 2 - 1910.147.

II. AUTHORITY

- OR-OSHA Division 1, 437-001-0760, Rules for All Workplaces
- OR-OSHA Division 2 Administrative Rules, Subdivision J**,** *General Environmental Controls* (includes Lockout/Tagout, Confined Spaces) - (AO 6-2012) Rules 437-002-0140 to 0154 and 1910.141-1910.147;
- OR-OSHA Division 2 Administrative Rules, Subdivision S**,** *Electrical* - (AO 3-2015) Rules 437-002-0147 and 1910.147(c)(2)(iii)
- OR-OSHA Division 2, Subdivision O, Machinery and Machine Guarding
- OR-OSHA Division 2/Subdivision S, Electrical
- OR-OSHA Division 3/Subdivision K, Electrical
- OR-OSHA Division 4/Subdivision J, Work Environment
- OR-OSHA Division 4/Subdivision O, Equipment Guarding
- 437-002-0146: Permit-Required Confined Spaces;
- 437-002-0303: Training and Work Planning
- 1910.146: Hot Work Permits;
- 1910.147: The Control of Hazardous Energy (Lockout/Tagout);
- 1910.212: General Requirements For All Machines; [*including woodworking, cooperage, abrasive wheel machineries, mills and calendars in the rubber and plastics industries, mechanical power presses, forging machines, mechanical power-transmission apparatus, etc.*]
- 1910.301: Electrical Safety-Introduction (S-3);
- 1910.333: Selection and Use of Work Practices (Electrical, S-92);
- ANSI B11.19 *Performance Criteria for Safeguarding;*
- ANSI/ASSE Z244.1 *Control of Hazardous Energy – Lockout/Tagout: Alternative Methods*

III. RESPONSIBILITY

A. Department Management

Managers and supervisors of authorized employees are responsible to provide instruction on the lockout/tagout procedures and their safety significance as outlined in the training requirements of this plan. The supervisors are responsible for conducting periodic audits to ensure that proper lockout/tagout procedures are being followed and record the results of the audit on an inspection form.

Managers and supervisors have responsibilities to:

- Identify which employees are authorized and which are affected employees,
- Ensure that all authorized and affected employees understand and comply with the LO/TO plan,
- Verify that authorized employees receive training on this plan prior to being issued a lock,
- Identify equipment and machinery which is subject to LO/TO procedures,
- Identify equipment that has hazardous energy characteristics and for providing instruction on the lockout/tagout procedures to employees who work on specific equipment, or systems.
- Provide locks, tags, hasps, and locking mechanisms to authorized employees.
- Conduct periodic lockout inspections performed by authorized employees,
- Supply equipment-specific lockout information to contractors who are working in their area, and
- Where appropriate, coordinate authorized employees LO/TO equipment when working together with contractors in the area.

B. Employees

All PCC employees, are responsible to follow this plan. Authorized employees are to use their assigned lock and key (or an individual lock at the lockout center). No other person shall be allowed access to their key or lock. No one is allowed to remove a lock except the authorized person applying the lockout/tagout.

1. **Authorized Employees** *Authorized* employees have the responsibility to:

    - Read, understand and follow this lockout/tagout procedure,
    - Inquire with supervisor to see if lockout/tagout training is current and appropriate,
    - Follow LO/TO procedures for machines and/or process in accordance with department, or machine-specific instructions,
    - Recognize possible changes and additional hazards not listed in the current LO/TO procedure,
    - Notify Supervisor immediately of possible changes and additional hazards not listed in the current LO/TO procedure, and
    - Notify *affected* employees prior to initiating LO/TO procedures and again after the LO/TO is complete.

2. **Affected Employees** *Affected* employees are those who work on, or around equipment, but are not trained in the lockout/tagout procedures.

   Affected employees have the responsibility to:

   - Not operate or use equipment on which servicing and maintenance is being performed under lockout/tagout, or whose job requires them to work in the immediate area in which such servicing and maintenance is being performed,
   - Follow the instructions of the authorized employees and/or Supervisor when a lockout of equipment is in the affected employees' work area,
   - Inform authorized employees of any circumstances that could affect the work to be conducted, and
   - Not attempt to operate any equipment being locked out, or tagged out, and follow all safety procedures in shut down and restarting equipment.

3. **All Employees** Those who are not authorized nor affected employees have the responsibility to:

   - Observe for inadequacies in the performance of lockout/tagout, or deficiencies in this plan.
   - Report inadequacies, deficiencies, concerns, or LO/TO questions to a manager, supervisor, lead person, or the EH&S Manager, and
   - Make NO attempt to start or remove any lockout/tagout device on ANY equipment.

C. Environmental Health and Safety (EH&S)

Environmental Health and Safety (EH&S) is responsible for writing, reviewing, and updating the *Control of Hazardous Energy and Lockout/Tagout* plan, as well as providing training and training materials to authorized and affected employees and maintaining training records.

EH&S assists in providing employee safety training and auditing for compliance with this chapter and OR-OSHA regulations.

EH&S will serve as the subject matter expert to PCC's departments with regards to LO/TO.

D. Project Manager

Project Managers are responsible to ensure contractors are following ALL control of hazardous energy and lockout/tagout requirements as found in in OAR 437-002-0147.

When managing an outside Contractor, the Project manager is to:

- Ensure that the contractor's activities do not create hazards, which normally are not present to PCC's employees,
- Mutually agree with the contractor on the procedure and to establish the lockout/tagout devices that will be used to protect PCC's employees and the contractor's workers. This coordination will help to ensure that all of PCC's employees know what kind of work is to be performed, where and when it is to be performed, and how they are being protected,

- Identify the energy isolating devices for the contractor. The contractor's employees will be responsible to lockout all devices capable of locking or place an energy control tag on or as near the device as possible,
- Coordinate with PCC departments, as needed, to control energy in areas where PCC and contract employees are both affected or areas where access is restricted to PCC employees,
- Follow the contractor's own LO/TO plan including applying and removing their own locks when required,
- Inform the contractor of PCC's respective lockout or tagout procedures and coordinate application of the lockout/tagout plans when both are in use,
- Follow requirements in the Health & Safety Manual, Chapter 18: *Contractor Hazard Notification Plan*, including the completion of the *Contractor Notification Project Hazard Assessment*,
- Inform the Contractor of PCC's *Control of Hazardous Energy and Lockout/Tagout* plan and the policies related to the Contractor's identification of hazardous energy sources and the application of LO/TO devices,
- Coordinate any LO/TO operation with the Contractor and if PCC employees will also be affected by the LO/TO in the location,
- Debrief with the Contractor on any problems encountered using the LO/TO process, and document the debrief information on the *Contractor Notification Project Hazard Assessment*,
- Retain the signed *Contractor Notification Project Hazard Assessment* in the Contractor file, and
- Provide a copy of the completed *Contractor Notification Project Hazard Assessment* to PCC's Management/staff, when requested.

IV. PROCEDURES

A. General Safety

This procedure covers the servicing and maintenance of equipment and systems that could cause serious injury to employees when an unexpected energizing, start up, or release of stored energy occurs.

The methods used to control hazardous energy is the utilization of a lockout / tagout procedure. ALL sources of energy including forms of potential or kinetic, and sources of electrical, mechanical, gravitational, hydraulic, pneumatic, thermal, chemical, and radiation need to be considered.

Lockout shall be the exclusive method used for the isolation of ALL energy sources that are designed to accept a locking device.

Tagout devices, such as tags or signs, must be used if a locking device cannot be attached to the control switch or valve.

Tags and their means of attachment are to be substantial enough to prevent inadvertent or accidental removal. Nylon cable ties, that can withstand 50 pounds of pressure, are the recommended method of tag attachment.

Whenever major replacement, repair, renovation, or modification of equipment is performed, and whenever new equipment is installed, the energy control switch or valve for that equipment shall be able to accept a locking device.

Managers and supervisors have a duty for employee's safety around areas where a LO/TO device is installed. Competent contractors also have the same obligation when performing LO/TO work.

1. Hazardous Energy Sources

Authorized personnel are to use LO/TO to control **ANY** hazardous energy sources that include; mechanical, pneumatic, hydraulic, electrical, chemical, and thermal (e.g., high or low temperature) that could cause injury to employees.

The placement of a lockout device on a hazardous energy source, in accordance with an established procedure, is to ensure that the hazardous energy is isolated by the lockout device and the equipment being controlled cannot be operated until the lockout device is removed.

The placement of a tagout as an energy-isolating device may be used when a lockout device cannot be used. The tagout may also be used in conjunction with a lockout device.

For example, placement of a tagout device on a circuit or equipment that has been de-energized, in accordance with an established procedure, to indicate that the circuit or equipment being controlled may not be operated until the tagout device is removed.

The authorized employee must ensure that:

a. Tagout provides equivalent protection to lockout, or
b. That lockout is infeasible and the authorized employee has relieved, disconnected, restrained and otherwise rendered safe, stored (residual) energy.

2. Conditions Requiring Lockout/Tagout

Typical conditions requiring lockout or tagout devices at the PCC facilities include:

- Anytime repairs, servicing and/or changes are being done on machines or equipment and the safeguards are by-passed, or work on electrical circuits in which the employee could come into contact with hazardous energy occurs (mechanical, pneumatic, hydraulic, or stored energy),
- Whenever moving parts of machinery or equipment are being cleaned or oiled and accidental contact with movable parts is possible,
- When it becomes necessary to remove a plug or to clear blocked mechanisms or pumps which exposes the employee to potential release of hazardous energy,
- When working on lines which contain hazardous substances, or high-pressure lines. Such systems should be clearly marked. Valves in the system should be capable of being locked out. In the case of high-pressure lines, there should be a means of safely relieving pressure in blocked sections,
- To lockout power to equipment to prevent use by unauthorized persons and/or to prevent use in off hours.

NOTE: <u>NO</u> employee shall attempt to operate any switch, valve, or other energy-isolating device bearing a lockout or tagout device.

Lockout by securing switch levers to prevent activation of electrical circuits or equipment on which work is being done. If it is not capable of being locked apply a tagout which is securely fastened to the disconnect lever or at the immediate area to warn of the on-going procedure.

Other basic controls that may be needed due to the type of energy present include:

- **Hydraulic Energy:** Close valve and bleed off line, or block the device,
- **Air Pressure:** Close valve and bleed off pressure from line prior to working on the device. Some valves when they lose pressure open, which can cause hydraulic or other liquid flows, which could be hazardous to employees. These valves must be isolated and controlled,
- **Springs:** Attach a hold down device or leave in open position where no stored energy is present,
- **Fluid Flow - Water Pressure**: Ensure proper gate devices are used that hold the backpressure, or drain lines so no fluid pressures present.

3. Written Machine-Specific Lockout/Tagout Procedure

A written machine-specific lockout/tagout procedure may be required due to the unique nature of the equipment, or machinery, and should be documented on the *Lockout/Tagout Documenting Specific Energy-Control* form.

The authorized employee must know:

- Types and magnitude of energy,
- Hazards posed by that energy,
- Methods to effectively control the energy sources,
- How to turn off the machinery or equipment according to operating procedures,
- If a team lead is needed to coordinate the process if more than one authorized employee is involved with the shutdown.

a. If one or more of the following conditions exist, the responsible department will provide a written, machine-specific lockout/tagout procedure.

   1) The machine, or equipment, has potential for stored, or residual, energy or re-accumulation of stored energy after shutdown.
   2) The machine, or equipment, has more than a single energy source which can be readily identified and isolated.
   3) The isolation and locking out of that energy source will not completely de-energize and deactivate the machine, or equipment.
   4) The servicing, or maintenance could create hazards for other employees.

b. **Machine-specific LO/TO** procedures will include the following.

   1) Name and location of the machine/equipment.
   2) Types and magnitude of ALL types of energies that supply the equipment.

3) ALL sources of stored energy.
4) The specific location of each energy source.
5) Complete the *Lockout / Tagout Checklist for ALL Energy Sources* [Form 1] to verify that the sources are locked in a safe position.
6) Complete the *Lockout / Tagout Electrical Safety Self-Inspection* [Form 2] to verify that electrical sources have been identified and verified for LO/TO.
7) Complete the machine-specific procedure *Lockout / Tagout Documenting Specific Energy-Control* [Form 3] to verify that machine-specific sources have been identified and verified for LO/TO.
8) Complete the *Lockout / Tagout Procedure Inspection* [Form 4] to document an inspection of a written lockout or tagout procedure or task.

4. Lockout/Tagout Devices and Equipment

Energy-isolating devices are the primary means for protecting PCC employees who service equipment and must be designed to accept a lockout device. Energy isolating devices must clearly identify function (Appendix B).

Considerations for acceptable LO/TO devices:

- Locks, tags and hasps will be used as energy isolating devices,
- Valves with handle and lock attachment hole will be locked out,
- If the locks become damaged in any way immediately seek a replacement lock,
- Valves not capable of being locked-out will have tags placed on them with a slip lock plastic attachment device capable of withstanding 50 pounds of pressure.

ALL lockout and tagout devices must meet the following criteria to ensure that they are effective and <u>not</u> removed inadvertently:

- **Durable** to withstand weather and all types of exposures.
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, and substantial to prevent inadvertent or accidental removal,
- **Standardized** by color, or shape, or size, or format.
Lockout and tagout devices must be designated by color, shape, or size. Tagout devices must have a standardized print and warning format,
- **Substantial** locks so they cannot be removed without excessive force.
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,
- **Identifiable**. Any employee who sees a lockout or tagout device must be able to recognize who attached it and its purpose,
- **Unique** device used for controlling energy and <u>not</u> used for other purposes,
- Each lock must have a **unique key**, or combination,
- Tag attachment devices need to be non-reusable, attached by hand, self-locking, minimum unlocking strength of no less than 50 pounds,

- Lockout/tagout devices shall indicate identity of employee applying device,
- Tag must have a written warning on it, i.e., **Do Not Start.**

Locks, tags, hasps, chains, and other restraining devices will be kept by each authorized employee. Additional locks and equipment will be kept by each FMS department. Each supervisor will review the location of the lockout centers and how to obtain additional lockout equipment as necessary (Appendix B).

A log of LO/TO activities will be updated and retained by each FMS facility manager and documented in the *Lockout/Tagout Log Book* (Form 5).

Out of Service Tag: The maintenance staff and other PCC personnel may need to use an out of service tag when a piece of equipment is not functioning properly and it needs to be removed from service for the protection of the equipment.

'DO NOT OPERATE' tag is NOT to be used for LO/TO Hazardous Energy Control.

'DO NOT OPERATE' tags will be Caution Tag Yellow in color (see Appendix B).

NOTE: *Once work begins on the equipment that places the employee in danger of hazardous energy release the authorized employee(s) must place their personal lock and tag on the energy-isolating device.*

5. Energy Sources

Lockout or tagout of electrical, and other energy sources, must occur at the circuit, switch, or disconnect. Electrical control circuitry does not effectively isolate hazardous energy.

Forms of energy covered under the procedures of this plan include:

- Potential,
- Kinetic.

Sources of energy, or types of energy include:

- Electrical,
- Mechanical,
- Gravitational,
- Hydraulic,
- Pneumatic,
- Thermal,
- Chemical,
- Radiation.

B. Hazard Equipment Evaluation

Authorized employees will know all the hazardous energy sources within equipment, machinery, or process. This knowledge shall be communicated to others in the LO/TO process and also communicated to the affected employees by the installation of the LO/TO, and how it may impact their work areas.

PCC's personnel involved in the maintenance, repair and servicing of equipment that requires the bypassing of guards are required to follow this policy. Those involved will be instructed in the safety significance of the lockout procedures.

Affected employees job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires them to work in an area in which such servicing or maintenance is being performed.

A hazardous equipment evaluation is not required for repair and service on cord and plug electrical equipment where the cord is pulled from the energy source prior to repair. If the plug remains under the exclusive control of the employee performing the servicing, and there are no other sources of energy (mechanical, pneumatic, hydraulic, or stored energy), no additional lockout/tagout procedures are required.

PCC's LO/TO plan consists of energy control procedures, employee training, and periodic inspections. These are to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury. It is the goal that the machine or equipment shall be isolated from the energy source, and rendered inoperative.

C. Lockout/Tagout (LO/TO) Procedure

Complete the *Lockout / Tagout Electrical Safety Self-Inspection* (Form 2) to verify that electrical sources have been identified and verified for LO/TO (1910.331 - 1910.335).

The lockout/tagout procedure includes the following steps:

Step 1 LO/TO Hazardous Conditions
Step 2 LO/TO Action Sequence
Step 3 LO/TO Communication
Step 4 Testing Equipment Under LO/TO
Step 5 Removal of LO/TO
Step 6 Restoring Equipment After LO/TO
Step 7 LO/TO Using Multiple Users
Step 8 LO/TO Periodic Audit Inspection

Step 1 LO/TO Hazardous Conditions

Utilize the *LO/TO Checklist for ALL Energy Sources* [Form 1] to document this process.

There must be specific intended use for the procedure which includes;

a. List <u>all</u> equipment or machines that need to locked, or tagged out,
b. Identify equipment or machines that have unexpected start-up,
c. Determine the maintenance steps and review for hazards,
d. Specific procedures may be required to neutralize energy sources which include (utilize Form 3),
    - Shut down,
    - Isolating,
    - Blocking,

- Securing,
- Installing locks and tags, and
- Removing of locks and tags.

e. Responsibility for the LO/TO devices,
f. Testing and verification procedures,
g. Methods of ensuring compliance (accountability),

Complete the *Lockout / Tagout Electrical Safety Self-Inspection* [Form 2] to verify that electrical sources have been identified and verified for LO/TO (1910.331 - 1910.335). Retain Form 2 with Form 1 for documentation and audit purposes.

If electrical work is the only hazard, complete the *Lockout / Tagout Electrical Safety Self-Inspection* to document the condition. Electrical work may be part of the procedure.

Step 2 LO/TO Action Sequence

The following steps should be taken to perform a LO/TO.

a. Preparation
   - Authorized employees must know about the LO/TO,
   - Types and magnitude of energy must be identified,
   - Hazards that are posed by the energy source(s),
   - Methods to effectively control the energy.

b. Shutdown
   - Machinery and equipment must be turned off according to machinery operating procedures,
   - If more than one authorized employee is involved with shutdown, a team lead needs to coordinate the process.

c. Energy Isolation
   - Authorized employee needs to verify the operation of the isolation device,
   - Engage switches, or buttons, to verify that zero energy is attained.

d. Lockout/Tagout Application
   - Lockout devices are a positive means of securing energy sources,
   - All lockout devices must be able to hold in a safe, or off position,
   - Tagout devices must have a prominent warning,
   - Tagout can only be used alone when the energy is not capable of being locked out, or
   - Tagout can demonstrate that they provide the full protection of locks.

e. Controlling Stored Energy
   - ALL energy must be relieved, disconnected, or restrained,
   - Re-accumulating energy must be dissipated and locked out.

f. Verify Zero Energy State
   - In all cases, ALL energy sources must attain zero energy state,
   - If zero energy cannot be attained, LO/TO additional sources, verify and retest.

The *LO/TO Decision Flowchart* in Appendix C may be used to guide the process.

Step 3 LO/TO Communication

a. Notify Employees.
Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

b. Lockout/tagout application.
The authorized employee shall refer to the lockout procedure to identify the type and magnitude of the energy that the machine or equipment utilizes. The affected employee(s) shall be advised to understand the hazards of the energy, and shall know the methods to control the energy.

c. Affected equipment.
When maintenance is going to be performed, all employees that may be affected should be notified. Notify what equipment will be affected, the timing of the work and how long the equipment may be unavailable. If equipment is unavailable, a change in work processes may need to be instituted.

d. Removal of LO/TO.
Inform affected employees when the LO/TO devices will be removed.

Step 4 Testing Equipment Under LO/TO

The following steps should be used for testing equipment under LO/TO.

a. Verify LO/TO device(s).
Verify placement of all lockout or tagout all energy sources using energy-isolating devices. Plan for the placement, removal, and transfer of lockout devices as needed to lockout energy source(s).

b. De-energize equipment.
Shut down, remove, drain, neutralize, secure, isolate, or block any potential (stored) energy. To ensure personnel safety and reduce potential for equipment damage, the shutdown instructions should be detailed. Detail the actions to be taken to properly shutdown the equipment, and the correct sequence. The reverse may be required for the startup process.

c. Dissipate stored energy.
Verify that all energy has been removed, or isolated. The primary energy sources may include; electricity, steam, water, gas, compressed air, or other sources that the person performing the maintenance may not know. Explain exactly what needs to be done in a step-by-step process.

d. Secure energy-isolating devices.
Verify the equipment is isolated from hazardous energy and rendered inoperative with the application of the LO/TO device(s).

e. Verify isolation by energizing.
Test methods to verify equipment has reached a safe, zero energy state. Disconnect all primary and secondary sources of energy. Attempt to start the

equipment to verify that the lockout has been successful. Verify that there are no affected employees near the equipment when the test-start is performed. Return all switches to the 'off' positions so that the equipment is deenergized in case the energy sources are reconnected. Once the lockout is verified, attach a lockout or tagout device on the equipment at the energy source to ensure that the equipment cannot be started without removal of the LO/TO.

f. Correct energy not isolated.
If there is residual, stored, or energy that has not been isolated, stop and reevaluate the energy source. Additional LO/TO devices may need to be applied and the system retested. Continue until zero energy is achieved.

Step 5 Removal of LO/TO

a. The written energy control procedure will address the temporary removal of lockout or tagout devices. Temporary LO/TO removal is allowed when re-energizing equipment is necessary, for example when power is needed to test or position the equipment. This applies only for the limited time required to perform the task and the procedure must be documented.

b. Re-apply the LO/TO after testing.

c. The equipment must remain in lockout/tagout condition across shift changes so that workers arriving are aware that the equipment is out-of-service. If individual locks or tags are used, the individual responsible for designating the LO/TO and the individual responsible for it during the next shift must BOTH be present when the locks and tags are switched.

Personnel are NOT permitted to remove another individuals' lock or tag!

Step 6 Restoring Equipment After LO/TO

When the work is done and all tools and other materials have been removed, the machine or equipment can be brought back into operation. The specific energy-control procedure should list the exact steps that are involved, along with the correct restart sequence.

When the servicing or maintenance is completed, and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

a. Remove tools, verify operational equipment intact
Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

b. Remove affected employees from area
Check the work area to ensure that all employees have been safely positioned or removed from the area.

c. Verify controls
Verify that the controls are in neutral, or 'OFF'.

d. Remove LO/TO
Remove the lockout devices and reenergize the machine or equipment.

Note: *The removal of some forms of blocking may require re-energization of the machine before safe removal.*

e. Notify employees
   Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

A post LO/TO review of the procedure should include all participants in the LO/TO.

Any deficiencies, energy sources, or issues discovered and not covered in the procedure should be included for the next LO/TO. This machine-specific procedure should be posted near the machine for future reference.

Step 7 LO/TO Involving Multiple Users

For some locations, a group of authorized employees may need to service equipment that has several energy sources and several energy-isolating devices. Under group lockout, just one designated person in the group assumes responsibility for securing each energy-isolating device.

There are a number of variations of group lockout; the group lockbox variation (see Appendix B) reduces the number of locks and makes it easier for employees to coordinate their activities.

The designated person locks out each of these energy-isolating devices and puts the key into a group lockbox with a multi-lock hasp. These authorized employees place their locks on the group lockbox before they begin work. After each worker finishes, the worker removes his lock from the box. The designated person's lock is the last lock removed.

For complicated energy-control systems, group lockout can reduce the number of lockout devices that employees must use.

Group lockouts can also reduce the risk of injury for service and maintenance employees, contractors, and other affected employees who do not regularly work with complicated energy control systems.

The following six (6) steps must be followed for a group lockout:

1. A designated, authorized employee in the group secures each energy-isolating device with a personal lock.

2. The same designated, authorized employee places the key that fits each lock in a group lockbox with a multi-lock hasp.

3. The other authorized employees in the group secure the lockbox – they attach their personal locks to the box – before beginning their service work.

4. After each employee finishes service work on the equipment, that employee removes his or her personal lock from the lockbox.

5. After all the employees have finished their service work and removed their personal locks from the lockbox, the designated, authorized employee who placed the key in the box removes it.

6. The designated, authorized employee uses the key to remove the lock from each energy-isolating device.

Much more on group lockout can be found in Chapter 4 of Oregon OSHA's Program Directive A-156.

During shift or personnel changes the hazardous energy control responsibility will be transferred in a manner that maintains uninterrupted protection for the employees involved. Use the *Detailed Job Hazard Analysis* [Form 7] to document additional hazards associated with the task.

Step 8 LO/TO Periodic Audit Inspection

The LO/TO Periodic Audit Inspection is intended to assure that the energy control procedures continue to be implemented properly, and that the employees involved are familiar with their responsibilities.

OR-OSHA requires that an inspection type audit of lockout/tagout procedures must be performed **AT LEAST ANNUALLY.**

The authorized employee, other than the ones(s) utilizing the energy control procedure being inspected, are responsible for conducting periodic audit inspections to ensure that proper lockout/tagout procedures are being followed and record the results of the audit.

- Complete the *Lockout / Tagout Procedure Inspection* [Form 4] to document an inspection of a written lockout or tagout procedure or task.
- Complete the *Lockout / Tagout Periodic Audit Inspection* [Form 6] to document the LO/TO periodic audit inspection process.

The periodic audit inspection will be performed by an authorized employee, or manager, not involved in the energy control procedure being inspected.

The inspector must determine four issues:

- Whether the steps in the energy control procedure are being followed, and
- Whether the employees involved know their responsibilities under the procedure, and
- Whether there are any inadequacies in the employees' knowledge, abilities or use of the procedure, and
- Whether the procedure is adequate to provide the necessary protection.

The inspector will observe and talk with the employees in order to make these determinations. These inspections are intended to provide immediate feedback and action to correct any inadequacies observed.

The audit documentation will include:

- The equipment on which the procedure is used,
- The location and date of the inspection,
- The name of the person conducting the inspection,
- Employee(s) included in the inspection.

The Inspector will:

- Understand the LO/TO procedure,
- Verify the procedure's accuracy, completeness and effectiveness,
- If the inspector finds that employees are not following the energy control procedure, or that the procedure is not adequate, employees must be retrained and the procedure corrected.

The review of the *Control of Hazardous Energy and Lockout/Tagout* plan must inspect and certify all energy-control procedures. The review may be a single annual review covering all lockout/tagouts performed during a 12-month period. Corrective measures will be documented by revising the *Control of Hazardous Energy and Lockout/Tagout* plan as needed.

Written records shall be made of these inspections and the findings of these inspections will be kept by the manager.

V. Training

A key component of this plan is employee training. It is the supervisor's responsibility to see that all employees involved in this plan are trained. The authorized employees are to receive additional specialized training as outlined in this plan. The training must be documented by the manager/supervisor.

Training will be provided to ensure that employees understand the purpose and procedures of the *Control of Hazardous Energy and Lockout/Tagout* plan. ALL employees must be trained to know basic hazardous-energy concepts and the purpose of the devices used to control it. Training should provide the knowledge and skill required for the safe application, usage, and removal of lockout/tagout devices are conveyed to employees.

All training is to be documented and maintained by the Department. A training record shall kept of training for each employee receiving the training.

Retraining will be conducted whenever a periodic inspection reveals, or whenever there is reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures. The retraining will re-establish employee proficiency and introduce new or revised control methods and procedures as necessary.

A job safety briefing with all crew members should be held for all work procedures and assignments. The safety briefing should be recorded on the *LO/TO Documenting Specific Energy-Control* [Form 3], and/or on the *LO/TO Procedure Inspection* [Form 4]. These forms should be retained with the LO/TO work-order.

Control of Hazardous Energy and Lockout/Tagout training is a major requirement to ensure that all authorized and affected employees understand and demonstrate the ability to assess and follow energy control procedures.

EH&S provides detailed training to all employees involved in the control of hazardous energy utilizing the lockout/tagout process.

Only authorized employees who have completed this training and have the knowledge and can demonstrate the ability to apply and remove LO/TO devices can utilize LO/TO.

The LO/TO training elements are provided initially to all authorized and affected employees and then as needed including periodic practical training, or retraining.

The training includes, but is not limited to:

- Initial LO/TO training,
- Refresher LO/TO training for new equipment or assignments, and
- LO/TO retraining for deviations from or inadequacies of LO/TO.

VI. Recordkeeping

The LO/TO recordkeeping is detailed in OR-OSHA Rule 437-002(J) 1910.147.

Supervisors will keep LO/TO procedures, forms, and inspections for at least one year for review.

This yearly review will evaluate:

- The lockout/tagout procedures are adequate,
- Authorized and affected employees know their responsibilities,
- The procedures are being followed in the lockout/tagout plan.

Training records, and information regarding employee EH&S training such as agendas, handouts, presentation materials, rosters, etc., is maintained by the EH&S department when the EH&S department hosts/conducts the training. Departments that conduct their own employee LO/TO training should maintain the original documents but forward copies of the documents to the EH&S department.

All records are to be retained by the applicable departments for the duration established by the Oregon State Archives in conjunction with government regulations.

Copies of department training agenda, materials and rosters will be forwarded to EH&S.