Portland Community College Health & Safety Manual	Department: **Environmental Health & Safety (EH&S)**	
	Function: **Facilities Management Services**	
	Topic: **Chapter 10 - Control of Hazardous Energy (Lockout/Tagout)**	
	Board Policy: **B507**	Revised Date: **May 2020**

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 incorporate OR OSHA's requirements into PCC's operations involving the repair, servicing and maintenance of equipment, in order to prevent the unexpected release of hazardous energy from such equipment. These procedures will protect employee health and contribute to PCC's safety program by reducing hazards associated with energized equipment. These procedures constitute PCC's Control of Hazardous Energy (Lockout/Tagout) Plan and are intended to comply with OR/OSHA's Control of Hazardous Energy Standard.

Sections	**I.** Purpose
	II. Authority
	III. Responsibility
	A. Department Management B. Employees C. Environmental Health & Safety D. Project Managers
	IV. Procedures
	A. General Safety **B.** Evaluation of Equipment and Energy Control Procedures **C.** Selection of Lockout/Tagout Equipment **D.** Lockout/Tagout Process **E.** Restoring Equipment After Lockout/Tagout **F.** Group Lockout/Tagout **G.** Shift & Personnel Changes **H.** Contractors **I.** Periodic Inspections
	V. Training
	VI. Recordkeeping
Appendices	**A.** Definitions **B.** Lockout/Tagout Devices
Forms	**1.** LO/TO Equipment Evaluation and Energy Control Procedure **2.** LO/TO Periodic Inspection
Ref Docs	***i.*** Contractor Notification Project Hazard Assessment – Ref H&SM Ch 18

I. PURPOSE

The objective of Portland Community College's (PCC) Control of Hazardous Energy (Lockout/Tagout) Plan, aka the Plan, is to protect employees by clearly defining procedures for the control of hazardous energy. These procedures cover the servicing and maintenance of equipment in which the unexpected energizing, start up, or release of stored energy could cause serious injury to employees. All sources of energy need to be considered, including electrical, mechanical, hydraulic, pneumatic, chemical, gravitational, and thermal energy as well as radiation. The primary method of controlling hazardous energy shall be by the use of the lockout/tagout (LO/TO) procedures contained in this Plan. The basic rule mandates that all equipment under repair, servicing and maintenance shall be locked out and/or tagged out to protect against accidental or inadvertent operation when such operation could cause injury to personnel.

II. AUTHORITY

- PCC Board Policy B507
- 1910.147 OR-OSHA *Control of Hazardous Energy (Lockout/Tagout)* Standard

III. RESPONSIBILITY

A. Department Management – Managers/supervisors are responsible for the following within their departments:

- Identifying equipment with hazardous energy characteristics subject to this Plan
- Developing department-specific energy control procedures for each piece of applicable equipment (ref *Form 1: LO/TO Equipment Evaluation and Energy Control Procedures)*; identifying energy isolating devices for such equipment
- Identifying authorized and affected employees; ensuring they receive training and instruction and comply with this Plan
- Providing training and instruction to their authorized and/or affected employees regarding their department's energy control procedures
- Issuing lockout/tagout equipment to trained employees
- Conducting periodic inspections of their energy control procedures to ensure compliance with this Plan (ref *Form 2: LO/TO Periodic Inspections*)
- Supplying contractors working in their area(s) with equipment-specific lockout information
- Coordinating with contractors when group lockout with PCC employees will occur

B. Employees – PCC employees are responsible for adhering to this Plan based on their status as authorized employees, affected employees or other (see below, as well as *Appendix A: Definitions*). All employees are to recognize lockout/tagout locks, tags, hasps and other lockout devices and adhere to the warning statements associated with them. The removal of lockout/tagout equipment, installed by an authorized employee, by someone other than the installing employee, is grounds for disciplinary action.

1. **Authorized Employees:**
   - Reading, understanding and following this Plan,
   - Following department energy control procedures and/or machine-specific instructions for controlling hazardous energy
   - Recognizing potential changes and additional hazards not listed in the current department LO/TO procedures; notifying management of such changes/hazards
   - Notifying affected employees of LO/TO activities prior to initiating LO/TO procedures and after LO/TO activities are complete
   - Applying and using their assigned lock and key (or an individual lock at a lockout center) when locking/tagging out equipment they are servicing, maintaining or repairing
2. **Affected Employees:**
   - Not operating or using equipment under LO/TO; Following all safety procedures and instructions during shut down, LO/TO and restarting of equipment
   - Informing authorized employees applying LO/TO controls of any circumstance that could affect the work to be conducted
3. **Other Employees:**
   - Observing LO/TO operations and addressing concerns or questions about to a manager, supervisor, lead person, or the EH&S Manager
   - Never removing lockout/tagout devices once applied to equipment; never attempting to start equipment on which LO/TO devices are applied

C. Environmental Health & Safety (EH&S):

- Serving as the subject matter expert with respect to LO/TO
- Reviewing and updating this Plan
- Assisting managers & supervisors identify equipment with hazardous energy characteristics subject to LO/TO; assisting with the development of LO/TO procedures
- Providing initial LO/TO training to employees, whether authorized, affected or other; maintaining training records

D. Project Managers - Are responsible for ensuring contractors comply with all LO/TO requirements. When managing contractors, the Project Manager is responsible for:

- Meeting with contractors prior to starting work and completing *Ref Doc i*: *Contractor Notification Project Hazard Assessment*, as found in PCC's Health & Safety Manual, *Chapter 18 - Contractor Hazard Notification Plan*
- Informing contractor of this Plan, any department-specific LO/TO procedures and energy-isolating devices related to the scope of work performed by the contractor
- Coordinating LO/TO operations with contractor when both contractor and PCC authorized employees will apply LO/TO devices
- Informing the contractor of applicable procedures to follow (PCC's or contractor's) and determining the LO/TO devices that will protect all personnel
- Coordinating with PCC departments to control hazardous energy when both PCC and contractors are present or areas in where access is restricted to PCC employees
- Ensuring the contractor activities do not create hazards, which are not normally present to PCC employees.

IV. PROCEDURES

A. General Safety

1. **Energy** – Is the power for performing work and exists in many different forms, all of which are associated with motion, including electrical, mechanical, gravitational, hydraulic, pneumatic, thermal, chemical and radiation (see *Appendix A: Definitions*).
2. **Energy States –** Energy exists in two basic states: potential energy and kinetic energy. Potential energy is energy that has the opportunity for motion while kinetic energy is energy in motion.
3. **Hazardous Energy Sources –** Energy becomes hazardous when it builds to a dangerous level or is released in a quantity that could injure a worker. In order to keep workers safe, energy-isolation devices must be identified prior to servicing or repairing machines and equipment. (for more information, see *Sections IV. B. - Evaluation of Equipment,* and *D. Lockout/Tagout Process*).

B. Evaluation of Equipment and Energy Control Procedures –

Managers/supervisors shall evaluate the machinery and equipment within their departments in accordance with the requirements of this section and develop written energy control procedures to safeguard their employees.

1. **Equipment Evaluation –** The following criteria shall be used to determine whether machines or equipment are covered by this Plan:
   - Projected activities include service, maintenance or repair.
   - Unexpected energization, start-up, or release of stored energy could cause injury to employees.
   - Normal production operations require an employee to remove or bypass a guard or other safety device.
   - Normal production operations require an employee to place part of his/her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

   Exemption - This Plan does not apply to the following activities:

   - 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 the unplugging of 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 department manager/supervisor demonstrates that (1) continuity of service is essential; (2) shutdown of the system is impractical; and (3) documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

2. **Department Energy Control Procedures** – Procedures shall be developed, documented in writing, and utilized for the control of potentially hazardous energy when employees are engaged in the service, maintenance, and repair of equipment and machinery. These procedures shall clearly and specifically outline the scope, purpose, authorization, rules and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

   - A specific statement of the intended use of the procedure;
   - Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
   - Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and
   - Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

   Exception - Energy control procedures are not required to be documented in writing when:
   - The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut-down which could endanger employees;
   - The machine or equipment has a single energy sources which can be readily identified and isolated;
   - The isolation and locking out of that energy source will completely de-energize and de-activate the machine or equipment;
   - The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
   - A single lockout device will achieve a locked-out condition;
   - The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
   - The servicing or maintenance does not create hazards for other employees; and
   - The department manager/supervisor, in utilizing this exception, has had no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.

   When the exception to Section B.2 cannot be exercised, the department manager/supervisor shall use *Form 1: LO/TO Equipment Evaluation and Energy Control Procedure* to document the requirements of Section B.2 and post it prominently in the department for employees to review and utilize.

C. Selection of Lockout/Tagout Equipment

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

   - **Durable**: Lockout devices must work properly under the environmental conditions in which they are used. Warnings on tagout devices must be legible even in wet, damp, or corrosive conditions.

- **Standardized:** Lockout and tagout devices must be designated by color, shape, or shape, or size. Tagout devices must have a standardized print and warning format.
- **Substantial**: Lockout devices and tagout devices must be strong enough that they cannot be removed inadvertently. Tagout devices must be attached with a single-use, self-locking material such as a nylon cable tie with a minimum unlocking strength of 50 pounds.
- **Identifiable**: Any employee who sees a lockout or tagout device must recognize who attached it and understand its purpose. It must not be used for purposes other than the control of hazardous energy.
- **Unique:** Each lock must have a unique key; this means that only the employee who uses the lock has the key to that lock.
- **Provided by PCC:** Lockout/tagout devices shall be provided to employees who are trained and need to shut down equipment to service or maintain it.

Tags used in conjunction with this Plan are not to be confused with other specialized tags such as:

- **Out-of-Service Tags:** Are used by departments such as FMS Maintenance and are used to provide visibility that a piece of equipment is not functioning properly and it needs to be removed from service.
- **Do Not Operate Tags:** Are used by EH&S, Risk Services and other departments to denote that piece of equipment should not be operated for reasons of safety or regulatory compliance.

2. Choosing Between Lockout, Tagout, or Lockout/Tagout

- **Lockout (LO):** Lockout follows an established procedure for placing a lockout device such as a padlock on an energy-isolating device to create a physical barrier of protection. If an energy-isolating device can accept a lockout device, lockout must be used without exception.
- **Tagout (TO):** Tagout is a procedure for placing a warning tag or sign – a tagout device – on an energy-isolating device that cannot accept a lockout device. Tagout devices must be securely fastened to the energy-isolating device and must state that the equipment being serviced cannot be operated until the tagout device is removed. Tagout devices warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as: *Do Not Start, Do Not Open, No Not Close, Do Not Energize* or *Do Not Operate*. Tagout devices must control hazardous energy at least as effectively as lockout devices. Since tagout devices do not provide the same physical barrier to hazardous energy as lockout devices, it is harder to ensure that they are equally effective. For this reason, additional measures must be taken, e.g., removing a battery from a vehicle or removing a handle from a valve.
- **Lockout/Tagout (LO/TO):** Using a combination of both lockout devices and tagout devices is a recognized best practice, providing both the physical employee protection on an energy-isolating device and the visual/written notification to others. In such cases, tagout devices must be attached at the same point as lockout devices.

- If an energy-isolating device was not designed with an integrated mechanism for attaching a lockout device, authorized personnel shall consider using an accessory device that will allow for a lockout device to be quickly and securely attached, preventing the need for tagout alone. Refer to *Appendix B: Lockout/Tagout Devices* for examples and additional information.

D. Lockout/Tagout Process - The following six-step sequence shall be followed when applying lockout and/or tagout devices whenever an employee is required to:

- Remove or bypass a guard or other safety device
- Place any part of his/her body into an area on a piece of equipment at the point of operation or where an associated danger exists during the operating cycle

1. **Preparation for Equipment Shutdown** - Authorized employees performing LO/TO shall have knowledge of the types and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy. Additionally, affected employees shall be notified of the equipment shutdown and application of LO/TO devices.
2. **Machine or Equipment Shutdown** - Machinery and equipment shall be turned off or shut down according to procedures established for the machine or equipment. An orderly shutdown must be followed in order to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
3. **Machine or Equipment Isolation** – All energy-isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).
4. **Lockout and/or Tagout Device Application** – LO/TO devices shall be affixed to each energy-isolating device by authorized employees.
   - Lockout devices, where used, shall be affixed in such a manner that will hold the energy-isolating devices in a “safe” or “off” position.
   - Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy-isolating devices from the “safe” or “off” position is prohibited. If a TO device cannot be affixed directly to the energy-isolating device, it shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device. When tagout devices are used with energy-isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.
5. **Controlling Stored Energy** – After the application of LO/TO devices to energy-isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, or restrained, or otherwise rendered safe. If there is a possibility of reaccumulating stored energy to a hazardous level, verification of isolation shall be continued until servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.
6. **Verification of Isolation** – Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and de-energization of the machine or equipment have been accomplished.

E. Restoring Equi0pment After Lockout/Tagout - Once servicing and maintenance work is complete, the machine or equipment can be brought back into operation in accordance with the specific energy-control procedure established for the equipment.

1. Inspect the work area to ensure that non-essential items have been removed and ensure that machine or equipment components are operationally intact.
2. Check the work area to ensure that all employees have been safely positioned or removed.
3. Verify power controls are off or in a neutral position.
4. Notify affected employees that the LO/TO device(s) will be removed.
5. Remove the lockout and/or tagout device from the energy-isolation device.

   Note: The authorized employee that applied the LO/TO device(s) to the energy-isolating device shall be the only person allowed to remove his/her device(s) with one exception* (see below).

6. Re-energize the equipment or machinery.

There may be circumstances in which an authorized employee may need to temporarily remove LO/TO devices from energy-isolating devices to test, position, or re-energize a piece of equipment or a component. In such cases, the authorized employee shall follow steps E.1-6 above followed by the additional steps of:

7. De-energizing the system, and
8. Re-applying LO/TO devices to the appropriate energy control device

***Exception to step E.5** – The supervisor of an authorized employee that applied a LO/TO device to a piece of equipment is the only person allowed to remove the LO/TO device when that authorized employee is not available to remove it himself/herself. The supervisor shall:

- Verify the authorized employee who applied the device is not at the facility;
- Make all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
- Ensure that the authorized employee has this knowledge before he/she resumes work at that facility.

F. Group Lockout – When service or maintenance on a machine or equipment is performed by more than one authorized employee, a group lockout device, such as a hasp, shall be used allowing the application of multiple individual LO/TO devices to the same energy-isolation device. The following requirements apply to a basic group lockout:

- Each authorized employee servicing or maintaining a machine shall place his/her own personal lockout device or tagout device on the energy-isolating device.
- The authorized employee who applies the first lock and the authorized employee who removes the last lock are required to notify affected employees of the application or removal of the lockout devices.

Additional group lockout guidance is available from EH&S, such as the use of a group lockbox when large numbers of either authorized employees or lockout devices must be applied.

G. Shift & Personnel Changes – Specific procedures shall be developed and utilized by department managers for shift or personnel changes to ensure the continuity of LO/TO protection, including provision for the orderly transfer of LO/TO device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

H. Contractors - Whenever non-PCC personnel are to be engaged in activities covered by the scope and application of OR-OSHA's Control of Hazardous Energy (Lockout/Tagout) Standard, at a PCC facility, the following requirements shall be met:

- The PCC manager overseeing the contractor's activities and the contractor shall inform each other of their respective lockout or tagout procedures. This is best accomplished by completing *Ref Doc i: Contractor Notification Project Hazard Assessment* in accordance with PCC's Health & Safety Manual, *Chapter 18 - Contractor Notification.*
- The PCC manager described above shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the contractor's energy control program.

I. Periodic Inspections – Department managers shall conduct a periodic inspection of their energy control procedure(s) at least annually to ensure that the procedure(s) and the requirements of this Plan are being followed. The requirements for these inspections are as follows:

- Each periodic inspection shall be performed by an authorized employee other than the one(s) utilizing the energy control procedure being inspected.
- Each periodic inspection shall be conducted to correct any deviations or inadequacies identified.
- Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of the that employee's responsibilities under the energy control procedure being inspected.
- Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements established below:
    - Tags are only warning devices and do not provide the same physical restraint as a lock
    - Tags are not to be removed from energy-isolation devices without the authorization of the person who placed them; Tags are never to be bypassed, ignored or otherwise defeated
    - Tags must be legible and understandable by all authorized, affected and other employees

- The periodic inspection shall be documented on *Form 2: LO/TO Periodic Inspection.* This form shall be used by the inspector to certify that a periodic inspection was performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

V. TRAINING – PCC shall provide training on lockout/tagout to employees as follows:

A. Awareness Level Training – Is provided to new employees by EH&S as part of PCC's New Employee Safety Orientation class and consists of pictures of lockout/tagout devices and the requirement for all employees to heed all applicable warnings and never attempt to remove or bypass a lockout/tagout device.

B. **Lockout Tagout Training**:

1. EH&S provides training to each authorized and affected employee to ensure that the purpose and function of this Plan are understood and that the knowledge and skills required for the safe application, usage, and removal of energy controls are acquired by these employees.

2. Each department that has authorized or affected employees shall provide additional training to ensure that employees understand the purpose and function of the department's energy control procedure(s). *Form 1: LO/TO Equipment Evaluation and Energy-Control Procedure.*

a. Authorized employees shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means for energy isolation and control.

b. Affected employees shall receive instruction on the purpose and use of the energy control procedure.

c. Other – All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.

d. Retraining – Shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

Additional retraining shall also be provided whenever a periodic inspection reveals, or whenever a department manager/supervisor has reason to believe, that there are deviations from or inadequacies in an employee's knowledge or use of the energy control procedures. Retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

VI. RECORDKEEPING - All records required by this Plan are to be retained by the applicable departments for the duration established by the Oregon State Archives in conjunction with government regulations.

B. Training Records – Are maintained by the following organizations:

1. EH&S:
   - Awareness Training – Included in New Employee Safety Orientation
   - Initial LO/TO Training
2. Department Managers/Supervisors**:**
   - Training on Department Energy Control Procedures
   - Retraining

C. LO/TO Equipment Evaluations & Energy Control Procedures – Are maintained by applicable Department Managers/supervisors

D. LO/TO Periodic Inspections – Are maintained by applicable Department Managers/supervisors

E. Periodic Reviews of this Plan – Are maintained by EH&S