
CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

A. Introduction

This procedure establishes the minimum acceptable requirements for the lockout and tagout of machinery and equipment. The purpose is to protect all employees during machine and equipment servicing and maintenance where the unexpected start up or release of stored energy could occur and cause injury.

B. Responsibilities

Department Management

- Responsible for ensuring that this procedure and the equipment specific lockout/tagout procedures are adhered to, without deviation, whenever applicable.
- Responsible for providing the resources necessary (including equipment specific procedures, training, equipment, etc.) to comply with this procedure.
- Determine the employee(s) who are authorized to engage in lockout/ tagout procedures. Only those employees will be permitted to utilize lockout/ tagout equipment after they have been properly trained.
- Ensure that lockout/ tagout requirements are followed when individuals are exposed to unexpected energization or start up including:
 - ⇒ Guards or safety devices are removed from equipment.
 - ⇒ Servicing equipment or machinery.
 - ⇒ An employee must place a body part where it may be caught by moving machinery.
 - ⇒ Contact with any form of energy is possible (electrical, hydraulic, pneumatic, chemical, etc.).
 - ⇒ Confined space entries are performed.
- Ensure that employees use only color coded locks and approved tags provided for the purpose of locking and tagging out equipment.

Safety Manager

- Responsible for reviewing all equipment specific lockout/ tagout procedures to ensure that they contain all required elements.
- Perform routine audits on authorized employees who are performing lockout/ tagout to ensure compliance with the procedures & training required by the energy control program.
- Ensure that affected employees have been informed of basic hazards and the requirements to become authorized persons.
- Provide lockout/ tagout training for employees.
- Responsible for tracking, organizing, and keeping accurate files on all lockout/ tagout training conducted.

Employees

- All employees whose work is regulated by this section must comply with the established procedures on controlling hazardous energy sources. (Note: only authorized employees are permitted to perform energy isolation activities)
- Responsible for the equipment issued to them such as locks, lock devices, keys, and tags.
- An employee shall not attempt to operate any switch, valve, or other energy isolating device when it is locked out or tagged out.

- Employees working in the area of machinery or equipment affected by this policy but not authorized to utilize lockout/ tagout procedures will be responsible for notifying their immediate supervisor of any situation requiring lockout/ tagout.

C. Definitions

- Authorized Employee – A person who locks out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance that exposes him/her to potentially hazardous energy.
- Affected Employee – an employee whose job requires him/her to operate or use a machine or equipment or work in an area in which servicing or maintenance is being performed under lockout.
- Energy isolating device – a mechanical device that physically prevents the transmission or release of energy.

D. Requirements

Equipment specific lockout/ tagout procedures must be followed during the following situations or in the presence of the following conditions:

- Prior to any activity with a potential for release of hazardous energy in which an individual may be exposed. (Ex. Repair, adjustment, cleaning, disassembly, or lubrication activities)
- A piece of equipment has been found to be unsafe to operate and its use could cause injury due to the defect.
- Entry into a confined space where energized equipment or systems may endanger the safety of the worker(s). (Note: marked permit required confined spaces shall not be entered without receiving the Confined Space Entry training program and following the Confined Space Entry procedures)
- Installation or removal of equipment in which the unexpected energization or start up may endanger individual(s).

Equipment Specific Procedures:

- Energy control procedures must be developed for each piece of equipment that utilizes energy sources other than plug and pull. Equipment specific procedures must be available within each work area for use by all authorized employees. The equipment specific procedure must follow the format as described in Appendix A of this procedure.

Equipment:

The following equipment will be available, through the department in order to effectively utilize lockout/ tagout procedures.

- Locks with one key only, for the individual responsible for the application of a lock. All spare keys for lockout/ tagout will be discarded. All locks utilized for lockout/ tagout will be red in color.
- Multiple lock hasps will be utilized when lockout procedures require multiple lock application.
- Warning tags are to accompany the placement of each lock. Every lock or multiple lock hasp must be accompanied by an identification tag. The tag will not be removed except by the employee who placed it on the machine or equipment at the completion of the work requiring the lockout procedure.

- Breaker lockout devices will be available for all different breaker styles.
- Valve lockout devices will be available for all different styles of valves.
- Equipment to cut or break chain, locks, or hasps (lock cutters, hack saws, etc.) must be available if any emergency required the removal of a lockout device and the key is not available.

Preparation for Shutdown:

- In preparation for lockout, an initial survey must be made to locate and identify all energy isolating devices, to be certain which switch, valve or other energy isolating devices apply to the equipment to be locked out. More than one energy source may be involved.
- Before an authorized employee turns off a machine or piece of equipment, the authorized employee must have knowledge of the type and magnitude of the energy to be controlled and the methods or means to control the energy.
- Notify employees verbally, (and in writing if applicable), in the area that a lockout will be used as well as where and when it will be applied.

Machine or Equipment Shutdown and Isolation:

- All affected employees shall be notified that a lockout system is going to be utilized and the reason for it, before the locks are applied.
- If the machine or equipment is operating - shut it down by the normal stopping procedure.
- Physically locate and operate the switch, valve or other energy isolating devices so that the equipment is isolated from its energy sources and apply adequate hardware.

Lockout/Tagout Application:

- Refer to the Equipment Specific Lockout/ Tagout procedure for that piece of equipment.
- Inspect the equipment and identify all isolating devices. Determine which switch, valve, or energy isolating device controls each energy source.
- De-energize (achieve a zero energy state) and lockout all equipment and systems relating to the potential release of hazardous energy.
 1. Shut off all electrical power at the source. Safely release stored energy in inductive or capacitive circuits.
 2. Place a lock and tag on the control for the energy source. The device or equipment must accept a locking device. Note: the lock may need to be placed on a supplied lockout device (valve corner, breaker control, chain, etc,)
 3. Place a tag on the lock with the following identification:
 - The name of the person who placed it.
 - The date the tag was affixed.
 4. Bleed off all hydraulic/ pneumatic pressure and turn off all supply valves.
 5. Lower or block any moving or suspended parts to prevent its travel or cycling.
 6. Shut off all fuel, water, steam, or other chemical feed lines.
 7. Perform a lockout effectiveness check to ensure de-energization by testing the equipment. Ensure that no one can be injured by start-up before testing.

Note: If more than one employee will be working on the equipment, each employee must be in control of each energy source by affixing their own lock on a multiple lock hasp or by utilizing an employee lock box.

8. The employee attaching the lock/tag will carry the only available key to the affixed lock.
9. When equipment or machinery is to be restored to normal operations, check the area around the machines or equipment to insure that no one is exposed.
10. Inform all affected persons that the lockout devices will be removed. Include the time in which the equipment will be re-energized.
11. After all equipment and employees are clear, remove all lockout and tagout equipment. Operate the energy isolating devices to restore energy to the machine or equipment.
12. The lock(s) and tag(s) are to be removed by reversing the steps. Only the individual(s) who placed the devices in service are permitted to take them out of service.

Contractors:

- Outside contractors must be informed of the City of Pittsburgh lockout/tagout program if they will be working in the area where lockout/ tagout applies. The contractor must comply with the provisions of the city lockout/ tagout program or have a program that provides equal protection.
- Contractors will be responsible for identifying and supplying any required equipment needed to comply with the city lockout/ tagout program.

Multiple Lock Requirements:

- If more than one employee is required to lockout equipment, each employee will place his or her lock on the energy isolating device(s).
- When an energy-isolating device cannot accept multiple locks, a multiple lock hasp or lockout box is to be used.
- If a single lock is used in place of a multiple lock hasp, the key is to be placed in a lockout box or cabinet that allows the use of multiple locks to secure it.
- Each employee will then use their personal lock to secure the box or cabinet and will remove their lock in the reverse order when it is permitted to take them out of service.

Removal of locks by others:

- If the employee who placed the lock or tag is not available to remove it, the lock may only be removed by the supervisor, foreman or department manager after all attempts to contact the employee have been exhausted or with the employee's approval.
- The procedure for removal of the device must provide equivalent protection as would removal of the device by the employee who attached it.
- The supervisor, foreman or department manager must verify that the employee who attached the device is not in the facility. After the lock has been removed, the employee who originally placed the lock must be advised, prior to starting the next shift or when that employee returns to work, that the lock has been removed.

Testing or Positioning Machines and Equipment:

In situations where lockout tagout devices need to be temporarily removed from the energy isolating devices and the machine or equipment needs to be energized to test or position that machine or equipment, the following sequence of procedures must be followed:

1. Clear the machine or equipment of tools and other nonessential materials.
2. Remove employees from the machine or equipment area.
3. Remove locks and tags.
4. Energize and proceed with testing or positioning.
5. De-energize all systems.
6. Re-apply energy control measures.
7. Proceed as with any other lockout/ tagout procedures.

De-energization Involving Multiple Shifts:

If de-energization involves multiple shifts, a “pass down” of energy isolation must be performed as follows:

1. Authorized employee(s) on the current shift shall inform authorized employee(s) on the succeeding shifts on which equipment has been isolated.
2. The current shift authorized employee(s) shall ensure that all personnel are clear from exposure to the release of hazardous energy.
3. The current shift's authorized employee(s) shall remove their lock(s) and tag(s) from the energy isolating device(s).
4. Immediately after the removal, the succeeding shift shall isolate the energy to the equipment by following the equipment specific lockout/ tagout procedure.

E. Training

Authorized employees must be trained in the following:

- Recognition of hazardous energy sources
- Types and magnitude of hazardous energy in the workplace
- Methods, devices and procedures used to lockout, verify lockout and otherwise control hazardous energy on all pieces or types of equipment (including plug and pull equipment)
- Procedures for removing locks and returning a machine or piece of equipment to operation.
- Transfer of lockout responsibilities.
- Group lockout procedures.

Affected employees must be trained in the following:

- Recognize when energy control procedures are being implemented and
- Understand the purpose of the procedures and the importance of not attempting to start up or use the machine/equipment that has been locked out.

- All training must be documented. The Department of Personnel Safety Office will maintain all documentation.

F. Annual Audit

- At least annually, the equipment specific procedures for each department will be audited by a department supervisor.
- The department supervisor will conduct random inspections as a part of the department hazard assessment, to ensure the completion of equipment specific lockout/ tagout procedures.
- The audit will ensure that the provisions of this procedure cover the requirements set forth by the OSHA standard (1910.147) for controlling hazardous energy sources.
- This audit will be completed by reviewing the equipment specific procedure. The inspection will ensure that all energy sources are accounted for and properly controlled for each piece of equipment. In addition the department supervisor's inspection of this program will ensure that training has been conducted for all affected and authorized employees
- The department supervisor will certify this audit in writing. The department supervisor will certify the inspection on the attached audit form (Appendix B). If changes to any procedure are warranted, the change(s) should be noted under the comments section of the audit form. The audit form shall then be stored within the department and a copy sent to the Department of Personnel Safety Office.

LOCKOUT/TAGOUT (LO/TO) EQUIPMENT SPECIFIC PROCEDURE FORMAT (Total Shutdown)

Purpose: This procedure establishes the minimum requirements for the lockout and tagout of energy isolating devices in order to achieve the total shutdown of the equipment described below.

Scope: Applies to *insert machine or equipment this document refers to. Be specific.*

Procedural Responsibility: Only individuals certified as Authorized persons in Lockout/Tagout Training of this equipment are permitted to perform activities required by this procedure.

Safety Considerations:

- 1) Only individuals certified in Lockout/Tagout Training of this equipment are permitted to perform activities required by this procedure.
- 2) Additional PPE
- 3) Sources of Energy

ENERGY SOURCE / TYPE	MEANS OF ISOLATION
1.	•
2.	•
3.	•

Details of Procedure:

A. Tools, Material, and Equipment Required: (Provide a specific list).

B. Lockout Tagout for Total Shutdown

Step	Actions
1.	Prepare for Shutdown.
2.	Notify affected personnel.
3.	Shutdown Equipment.

C. Lockout Effectiveness Check

WARNING

- If the equipment can be activated, **STOP!!** Contact the area supervisor immediately. Do not proceed until the problem is corrected.
- Verify that equipment will not operate by:
 - If any electrical work is to be done, verify with a voltmeter that all input power phases are at zero potential.

D. Removal of Locks and Tags for Start-Up

Step	Actions
1.	Remove all non-essential tools, material or parts from the immediate area of the equipment.
2.	Verify that all guards and safety devices have been reinstalled and the machine is in safe operating condition.
3.	Notify all affected and related authorized personnel that the equipment will no longer be in a Lockout/Tagout condition
4.	
5.	

- Document any necessary follow up

LO/TO AUDIT FORM

LO/TO AUDIT FORM

DATE: _____

LO/TO PROCEDURE: _____

AREA/EQUIPMENT: _____

AUDITOR(S)	PERSONNEL AUDITED	DEPT.
_____	_____	_____
_____	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

RETRAINING REQUIRED? YES NO
RETRAIN WHOM? _____

RETRAIN FOR WHAT REASON? _____

AUDITOR'S
COMMENTS:

RETURN COMPLETED AUDIT FORMS TO THE SAFETY OFFICE (Room 431-CCB)