



Scope

This program¹ provides applies to all employees required to perform maintenance on equipment with the basic information on the Lockout/Tagout program and the requirements to ensure equipment is in a zero-energy state prior to any servicing or maintenance on the equipment. This procedure does not cover servicing or maintenance of cord-and-plug equipment as long as that equipment can be fully de-energized by removing the plug from the power outlet.

Purpose

The hazards of uncontrolled energy present the risk of serious injury and/or fatality to employees. It is essential that all employees understand these hazards and take effective steps to protect themselves from them. This program is designed to develop effective procedures for Lockout/Tagout (LOTO) and are to be used whenever equipment or machinery is being serviced, repaired, installed or otherwise modified and employees are exposed to uncontrolled energy.

Member-Level Responsibilities

On the line below, list the job title of the person who has primary responsibility for oversight of this policy. _____

Managers and first line supervision are responsible for compliance with this procedure, ensuring that equipment specific lockout/tagout procedures have been developed for the equipment in their work areas that is covered by this procedure, and that employees covered by this procedure are complying with these requirements and procedures. Managers and first line supervision are also responsible for ensuring that resources are available to meet the needs of the procedure, and for ensuring employees are provided with adequate training and supervision related to the use of equipment specific lockout/tagout procedures.

Employees who are authorized to perform servicing or maintenance of covered equipment (Authorized Employees) have the responsibility to be familiar with and adhere to all aspects of this procedure that apply to their work activities.

Employees who are not authorized to perform servicing or maintenance of covered equipment but could work in the vicinity of locked out equipment or be affected by the equipment being locked out (Affected Employees) are responsible for being familiar with and able to identify when a piece of equipment is under a locked-out condition. Upon observing a machine or piece of equipment which is locked out for servicing or maintenance, Affected Employees are not permitted to attempt to start, energize, or use that machine or equipment, and are not permitted to attempt to interact with that equipment until it has been released from the locked-out condition. Any questions regarding the requirements should be directed to their supervisor.

¹ The content of this program is based upon the following regulations:

- Pennsylvania Title 34, Part VIII, Bureau of Workers' Compensation – Chapter 129, Subchapter D §129.452; Group Self-Insurance Fund's AIPP Requirements
- Federal Occupational Safety and Health Administration (OSHA) regulations for The Control of Hazardous Energy, found at 29 CFR 1910.146.



Definitions

For purposes of this Protocol, the following definitions will apply:

Affected employees: All employees who work with, or around, the equipment that is being serviced who could be subject to the hazards created by the unexpected energization of the machinery.

Authorized employees: All employees who will perform work on energized or potentially energized equipment

Capable of being locked out: An energy-isolating device is capable of being locked out if it has 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.

Energized: Connected to an energy source or containing stored energy.

Energy-isolating device: A mechanical device that physically prevents the transmission or release of energy. Examples include: electrical breakers, valves, solenoids, gravity blocks, etc.

Lockout: The placement of a lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device: A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of equipment.

Low Voltage Work: Job tasks performed directly on or in proximity of systems of 600 volts, nominal, or less.

Servicing and/or maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing equipment.

General Procedures

In conjunction with the Electrical and Machinery Safeguarding Program SOP, it should be noted that unless an electrical installation or circuit is locked-out, it must be treated as live by employees. Interlocks will not be relied on for safety or to meet the requirements for lockout. The equipment or machinery must be locked out individually.

Equipment specific energy control procedures (ECP) have been developed for each piece of equipment covered by this program. These equipment specific lockout procedures are posted on or next to the equipment/machinery to be locked out as a quick reference for all authorized employees. A full set of the written ECPs is also maintained separately for backup and training purposes. The ECP identifies the specific steps to follow for shutting down the equipment, where and how to



activate the specific energy control devices, where to apply locks, the type of energy that needs to be released and how to release it, how to verify that the equipment is at a zero-energy state, and how to return the equipment back to service once the maintenance or servicing has been completed. (See the end of this procedure for the blank ECP form)

Any employee who does not follow these procedures may be subject to disciplinary action up to and including suspension or termination.

Lockout procedures do not apply to plug-and-cord equipment. However, this type of equipment is not without hazards. Therefore, prior to any work or maintenance being performed on plug-and-cord connected equipment, either portable or fixed, employees will unplug the equipment from its power source (this includes blade change out on any power saw) or lockout the power source. Employees must maintain control of the plug and keep it in sight while performing the task. If unable to do so, LOTO should be utilized or a second employee be made available to monitor the work task.

Sequence of Lockout

The following sequence must be followed by Authorized Employee every time LOTO is performed. **As noted above, specific energy control procedures (ECPs) have been developed for each specific machine. If it is not posted on or at the machine, the Authorized Employee performing the LOTO must obtain a copy of the ECP prior to starting the process:**

- Notify all Affected Employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment will be shut down and locked out prior to servicing.
- If the machine or equipment is operating, shut it down by the normal stopping procedure (typically by depressing the stop/off button, open switch, close valve, etc.).
- De-activate or apply the energy isolating device(s) (main switch, circuit breaker, flow/control valve, etc.) so that the machine or equipment is isolated from the energy source.
- Lockout all of the energy isolating devices with assigned individual lock(s). If more than one person is exposed to the hazard or is working on the machine or equipment, each person must attach their individual lock. Only the person who attaches the lock is authorized to remove their lock.
- Dissipate or restrain any stored or residual energy (such as that in capacitors, springs, elevated machine member, rotating flywheels, hydraulic systems, and air, gas, or water pressure, etc.) by such actions as grounding, repositioning, blocking, bleeding down, etc.
- Ensure that the machine or equipment is disconnected from the energy source(s) by first checking that no persons are exposed, then verify the machine or equipment is isolated by operating the push/on button or other normal operating control(s) or by testing to make certain the machine or equipment will not operate. Return operating controls to neutral or off position after verifying the isolation of the machine or equipment. For any electrical work, voltage checks will be made of any circuit elements and electrical parts on which work is to be performed and any exposed adjacent parts.

The machine or equipment is now locked out, and servicing or maintenance may proceed.



Restoring the Machine or Equipment to Service

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

To restore energy:

- Check the machine, make sure nonessential items and tools are removed from the machine, all components are operationally intact, and all guards are installed.
- Clear the work area and notify all affected employees that locks are going to be removed.
- Verify that the controls are in the neutral position.
- Remove the LOTO device and reenergize the equipment.
- Notify affected employees that servicing or maintenance is complete and the machine is ready for use.
- Make note of any issues or discrepancies in the written ECP or issues with the equipment and forward these to the manager or supervisor of the department.

Training for LOTO

LOTO training will be conducted annually for all affected and authorized employees. The training will address all components and procedures of this program. It will include methods to ensure employees understand the purpose and function of the program and that they know their responsibilities whenever a piece of machinery is being serviced.

Affected employees should understand the meaning of the lock and tag mechanisms and should avoid the equipment until receiving further instructions by the authorized employees or their supervisor.

Authorized employees will receive additional training on the specific lockout procedures for each piece of equipment they service. This training will ensure that they can recognize applicable LOTO situations, and that they have acquired the knowledge and skills required for applying, using, and removing the locks and tags.

Employees will be retrained whenever an audit, observation by a supervisor, or other information indicates that the employee requires reinforcement training on the procedures. It shall also occur whenever there are significant changes in work processes or equipment that affect an employee's ability to work safely, or when new equipment covered by LOTO is installed.

Assessment of the Program and Procedures

Each machine/equipment-specific lockout procedure will be assessed at least annually to ensure that the procedure remains valid or if any changes are warranted. This assessment must be on the equipment-specific ECPs and be documented on the Lockout Annual Assessment Form (See form at the end of this procedure). The annual ECP assessment will be conducted by an employee or supervisor who is an Authorized employee who is familiar with the equipment to ensure all energy sources have been correctly identified, isolated and controlled. Completed ECP assessment will be reviewed by the manager or supervisor of the department, and revisions to the procedures made if necessary.



Element 14.4 – Lockout Tagout

| Lockout/Tagout Annual Assessment | |
|----------------------------------|--|
| Machine/equipment being reviewed | |
| Date of Review | |
| Name of Authorized Reviewer | |
| Name of Employee Conducting LOTO | |
| Date of Review | |

| Yes | No | NA | Shutdown & Lockout Assessment Questions |
|-----|----|----|--|
| | | | Was equipment actually locked out for the review? |
| | | | Were all sources and magnitudes of energy identified in the ECP? |
| | | | Were affected employees notified prior to the lockout? |
| | | | Were shutdown procedures correct and followed? |
| | | | Were isolation procedures correct and followed? |
| | | | Were energy release procedures correct and followed? |
| | | | Were devices and locks the correct type and were they applied correctly? |
| | | | Was the zero-energy verification process correct and followed? |

| Yes | No | NA | Release from Lockout Assessment Questions |
|-----|----|----|--|
| | | | Were all guards and interlocks reinstalled prior to re-energization? |
| | | | Were all tools and other materials removed from the area? |
| | | | Were locks, tags, hasps, and devices removed in the proper order? |
| | | | Was the equipment tested to ensure it was working properly? |
| | | | Were affected employees notified when the equipment was placed in service? |

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| Comments: | |
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Element 14.4 – Lockout Tagout

Element 14.4 – Lockout Tagout Procedure Form

| | | | |
|---|--------------------------|---|--------|
| Equipment Name: | | | |
| Location: | | | |
| Author: | | Original Date: | |
| Types of Energy | | Location | |
| Electrical | <input type="checkbox"/> | [photo here] | |
| Mechanical | <input type="checkbox"/> | | |
| Chemical | <input type="checkbox"/> | | |
| Hydraulic | <input type="checkbox"/> | | |
| Pneumatic | <input type="checkbox"/> | | |
| Thermal | <input type="checkbox"/> | | |
| Other | <input type="checkbox"/> | | |
| Other | <input type="checkbox"/> | | |
| Equipment Required | | | |
| 5 Locks | | <input type="checkbox"/> Ball Valve Device | |
| 5 Tags | | <input type="checkbox"/> Butterfly Valve Device | |
| 5 LOTO Hasps | | <input type="checkbox"/> Chain | |
| <input type="checkbox"/> Circuit Breaker Device | | <input type="checkbox"/> Other | |
| Notification | | | |
| Prior to Work Beginning, Notify the Following: | | Name | Number |
| | | | |
| | | | |
| | | | |

| Shut Down Procedures | |
|----------------------|--|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |

| Applying Devices, Locks and Tags | |
|----------------------------------|--|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |

| Verifying Energy Control | |
|--------------------------|--|
| 1. | |
| 2. | |
| 3. | |

Element 14.4 – Lockout Tagout Procedure Form

| Removing Devices, Locks and Tags |
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| 1. |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |
| 8. |

| Returning Equipment to Service |
|--------------------------------|
| 1. |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |
| 7. |
| 8. |

| Procedure Audit/Verification | | |
|------------------------------|------|----------|
| Reviewer(s) | Date | Comments |
| | | |
| | | |
| | | |

Element 14.4 – Lockout Tagout Procedure Form - EXAMPLE

| | | | |
|--|-------------------------------------|---|----------------|
| Equipment Name: | | Higgins Air Compressor | |
| Location: | | Service Garage Bay 2 | |
| Author: | | John Doe | Original Date: |
| Types of Energy | | Location | |
| Electrical | <input checked="" type="checkbox"/> | Panel BB-02, Breakers 6 & 8 | |
| Mechanical | <input checked="" type="checkbox"/> | Compressor Flywheel | |
| Chemical | <input type="checkbox"/> | | |
| Hydraulic | <input type="checkbox"/> | | |
| Pneumatic | <input checked="" type="checkbox"/> | 120 psi when tank is full | |
| Thermal | <input checked="" type="checkbox"/> | Compressor Cylinder Fins | |
| Other | <input type="checkbox"/> | | |
| Other | <input type="checkbox"/> | | |
| Equipment Required | | | |
| 2 Locks | | <input checked="" type="checkbox"/> Ball Valve Device | |
| 2 Tags | | <input type="checkbox"/> Butterfly Valve Device | |
| 2 LOTO Hasps | | <input type="checkbox"/> Chain | |
| <input checked="" type="checkbox"/> Circuit Breaker Device | | <input type="checkbox"/> Other | |
| Notification | | | |
| Prior to Work Beginning, Notify the Following: | | Name | Number |
| | | Joe Supervisor | (555) 555-1234 |
| | | | |



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| Shut Down Procedures |
| 1. Press the OFF button on the front right control panel mounted on the compressor. |
| 2. Move Breaker 6 & 8 in Panel BB-02 to the off position. |
| 3. Close the red-handled ball valve on the main air supply line located behind and to the right of the compressor. |
| 4. Slowly open the air pressure bleed valve located under the right side of the compressor tank. |
| 5. Allow all stored air to be released, then leave the valve open. |
| 6. Verify the pressure has been released from the tank using the MAIN tank pressure gauge located on the left side of the control panel. |
| 7. Wait for the heat to dissipate from the cylinder fins. |

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| Applying Devices, Locks and Tags |
| 1. Apply a dual-breaker locking device to Breakers 6 & 8, and apply a locking hasp to the device. |
| 2. Apply a lock and completed tag onto the hasp on the breaker device. |
| 3. Apply a ball valve device, hasp, completed tag, and lock to the main air supply ball valve. |

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| Verifying Energy Control |
| 1. Check to ensure the motor and flywheel are clear. |
| 2. Press the START button on the control panel and verify the compressor doesn't start. |
| 3. Pull on the detent ring of the pressure release valve on the front center of the tank to verify air pressure has been fully released. |

Element 14.4 – Lockout Tagout Procedure Form - EXAMPLE

| Removing Devices, Locks and Tags |
|---|
| 1. Install any guards, covers, or panels removed during the servicing. |
| 2. Clear the area of any tools or equipment, and ensure other people are not near the equipment. |
| 3. Close the air pressure bleed valve located under the right side of the compressor tank. |
| 4. Remove the lock(s), tags, hasp and ball valve device from the red-handled ball valve on the main air supply line located behind and to the right of the compressor, and open the valve slowly. |
| 5. Remove the lock(s), tag, hasp and breaker device from Breakers 6 & 8. |
| 6. Move the breakers 6 & 8 to the ON position. |

| Returning Equipment to Service |
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| 1. Press the START button on the front right control panel mounted on the compressor. |
| 2. Verify the compressor is functioning correctly by observing the pressure reading of the MAIN tank pressure gauge located on the left side of the control panel. |
| 3. Notify affected employees that the air compressor is back in service. |
| 4. Notify the PW Manager of any issues or discrepancies noted during the lockout activity. |

| Procedure Audit/Verification | | |
|------------------------------|------------|-------------------------|
| Reviewer(s) | Date | Comments |
| Jane Foreman | 11/17/2040 | New guy needs training. |
| | | |
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