

# Control Of Hazardous Energy

## Lockout/Tagout

Millersville University - Office Of Environmental Health & Safety

## Scope & Application

The Lockout/Tagout program applies to the control of energy during servicing and/or maintenance of machines and equipment. This program specifically outlines the definitions, procedures and training requirements to be utilized by Millersville University employees to guard against the unexpected energizing, start-up, or release of stored energy that could cause injury. It is the duty of each employee to become familiar with the contents of this program and ensure compliance with its procedures. Heads of departments shall ensure that employees under their supervision receive training in the contents of this program and ensure records of this training are maintained.

## Purpose

The purpose of this program is to establish procedures for affixing appropriate lockout or tagout devices to energy-isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start-up or release of stored energy in order to prevent injury to employees

## Definitions

**Affected Employee** – Person who operates equipment or machinery on which service work is being performed under lockout/tagout, or someone who works in such an area.

**Authorized Employee** – A person who locks or implements a tagout procedure on machines or equipment to perform service work or maintenance on that machine or equipment. Note: Can also be the Affected Employee.

**Energy** – The capacity or force present in machines or equipment to do work, causing movement or possible movement. Note: Locks and tags do not de-energize equipment. Attach them only after machinery has been isolated from its energy source.

**Energy Isolating Device** – A mechanical device that physically prevents the transmission or release of energy. Be aware that push buttons, selector switches and other control circuit type devices are not energy isolating devices.

**Energy Source** – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other form of energy.

**Lockout** – The placement of a lockout device on an energy-isolating device, following established procedure, to ensure the energy-isolating device and equipment cannot be operated until the lockout device is removed.

**Lockout Device** – A device that utilizes a positive means, such as a lock, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or piece of equipment.

**Primary Authorized Employee** – The authorized employee who has been vested with

responsibility for a set number or group of employees performing service or maintenance on machines or equipment subject to lockout or tagout procedures.

**Point of Control** – Any electrical or mechanical device, such as a switch or a valve, which regulates or stops the flow of energy between machine and energy source.

**Residual Energy** (also known as Potential Energy) – Latent or leftover energy remaining in a machine after it has been shut down (e.g., a turning shaft or electricity stored in a capacitor).

**Tagout** – A written warning telling a co-worker not to operate a switch, lever, or valve that could release hazardous energy or set a machine in motion. The tag is the warning device.

**Two Person Rule** – A safety rule stating that two people must be present to remove a

When a tagout device is used on an energy-isolating device that is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached.

A standard tag, as suggested by the illustration at left, shall accompany lockout devices used for the implementation of this program.

These devices shall be used for no other purpose than lockout, and shall be substantial enough to prevent removal without the use of excessive force or unusual techniques. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum

shall cover the following elements and actions and shall be done in the following sequence:

1. Preparation for shutdown: Before an authorized or affected employee turns off a machine or piece of equipment, they shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy. Notify all affected employees that machinery and equipment will be out of service.
2. Machine or equipment shutdown: An orderly shutdown must be utilized to avoid any additional or increased hazards to employees as a result of equipment de-energization. If the equipment is in operation, follow normal stopping procedures (e.g., depress stop button, open toggle switch, etc).
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. Move switch or panel to "off" or "open" positions and close all valves or other energy isolating devices so that the energy source is disconnected or isolated from the machinery or equipment. Make sure to isolate all energy sources including back up power systems.
4. Application of Lockout/Tagout: Authorized employees shall affix lockout or tagout devices to each energy-isolating device. Lockout devices will be affixed in a manner that will hold the energy-isolating devices in the "off" or "safe" position. Lock and tagout all energy devices by use of hasps, chains and valve covers with assigned individual locks. Only Millersville University lockout/tagout equipment

elevated members, rotating fly wheels, and hydraulic/air/gas/steam systems) must be relieved or restrained by grounding, repositioning, blocking and/or bleeding the system.

6. Methods of releasing and/or controlling stored energy:
  - Make sure all moving parts have stopped
  - Install ground wires
  - Relieve trapped pressure
  - Release the tension on springs or block their movement
  - Block or brace any part that can fall
  - Block parts in pneumatic or hydraulic systems that could move due to loss of pressure
  - Bleed lines, let vent valves open
  - Drain process piping systems and close valves to stop flow of hazardous materials
  - To block a line where there is no valve, use a blank flange
  - Purge all tanks and lines
  - Dissipate extreme cold or heat
  - Make sure stored energy does not re-accumulate to harmful or dangerous levels
7. Verification of Equipment 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 has been accomplished.
  - Make sure the area is clear of personnel
  - Verify that main disconnect switch or circuit breaker can not be moved into the on position
  - Use a voltmeter or other device to check the switch
  - Press all start buttons and activate controls
  - Shut off machine controls when finished testing the equipment

**Release from Lockout or Tagout** - Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

**The Machine or Equipment** - The work area shall be inspected to ensure that nonessential items have been removed and that machine or equipment components are operationally intact.

**Employees** - The work area shall be checked to ensure that all employees have been safely positioned or removed. Before lockout or tagout devices are removed and before machines or equipment are energized, affected employees shall be notified.

**Lockout or Tagout Device Removal** - The employee who applied the device shall remove each lockout or tagout device from each energy-isolating device. Do not remove other employee's lockout or tagout devices.

**Removing Other Locks and Tags** - When the authorized employee who applied the lockout or tagout device (installer) is not available to remove it, that device may be

protection equivalent to that provided by the implementation of a personal lockout or tagout device. This shall be accomplished by:

- Ensuring all locks, tags, and procedures used by multiple employees must be equally capable of protection
- Designating a primary authorized person (employee) to organize and oversee the group LO/TO procedure
- The application of a multi-lock accepting device by the primary authorized employee to the energy- isolating device.
- The primary authorized employee attachi

- When a tag is attached to an energy-isolating means, it is not to be removed by anyone except the issuing authorized agent. A tag is never to be bypassed, ignored or otherwise defeated.
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are, or may be, in the area, in order to be effective.
- Tags and their means of attachment must be made of materials that will withstand environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- Tags must be securely attached to energy- isolating devices so that they cannot be inadvertently or accidentally detached during use.

## **Training**

The heads of departments or their designated representatives are required to provide training to ensure that employees understand the purpose and function of the energy control program. Through training, employees will be required to possess the knowledge and skills required for safe application, usage, and removal of energy controls. The Director of EHS will develop the core training curriculum and conduct initial training for authorized employees. Any work specific training (such as the use of energy control devices specific to a particular trade) will be conducted by the supervisor or their designee). All new employees must receive the training before they begin to use LO/TO procedures. Employees who should receive training include:

- **Authorized Employees** - Each authorized employee 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 necessary for energy isolation and control.
- **Affected Employees** - Each affected employee shall be instructed in the purpose and use of the energy control procedure.

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 process that presents a new hazard, or when there is a change in energy control procedures. Retraining shall establish employee proficiency and introduce new or revised control methods and procedures as necessary. The heads of departments or their designated representatives shall certify that employee training has been accomplished and is being kept up-to-date.