



MINNESOTA STATE
Northeast Higher Education District

LO/TO

LOCKOUT/TAGOUT PROGRAM

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Lockout/Tagout (LO/TO) Program

Section 1. Introduction

The OSHA standard for The Control of Hazardous Energy (Lockout/Tagout), 29 CFR 1910.147, addresses the practices and procedures necessary to disable machinery or equipment, thereby preventing the release of hazardous energy while employees perform servicing and/or maintenance tasks. The standard outlines measures for controlling hazardous energies, such as electrical, mechanical, hydraulic, pneumatic, chemical, thermal, stored, and other energy sources.

In addition, 29 CFR 1910.333 sets forth requirements to protect employees working on electrical circuits and equipment. This section requires workers to use safe work practices, including LO/TO procedures. These provisions apply when employees are exposed to electrical hazards while working on, near, or with conductors or systems that use electrical energy. If during servicing and/or maintenance of equipment, unexpected energization, startup, or release of hazardous energy could occur causing injury, a LO/TO program must be established.

General requirements for personal protective equipment (PPE) referenced in OSHA 29 CFR 1910.132, requires employers to determine if electrical hazards are present in the workplace and to select and provide appropriate PPE to ensure employee safety.

Section 2. Purpose

The purpose of this LO/TO program is to protect employees from the risk of injury by ensuring that before any employee performs servicing and/or maintenance of machines and equipment where the unexpected energization, startup, or release of hazardous energy could occur, all such hazardous energies are controlled.

All NHED employees must comply with the restrictions and limitations required during the use of LO/TO. Only authorized employees are approved to perform LO/TO procedures in accordance with this program.

All NHED employees must **never** attempt to energize, start, or use machines or equipment that are locked out or tagged out, as this unexpected energization, startup, or release of hazardous energy could harm employees.

Section 3. Application

The requirements of this program apply to the control of energy during servicing and/or maintenance of machines and equipment.

Note: Normal production operations are not covered under this program. Refer to the machine or equipment manufacturer's requirements for safe use and operation and CFR 1910.212, Machinery and Machine Guarding.

Servicing and/or maintenance which takes place during normal production operations is covered by this program only if:

- An employee is required to remove or bypass a guard or other safety device.
- An employee is required to place any part of their body into an area on a machine or equipment where work is being performed (*point of operation*) or where a related danger zone exists during a machine operating cycle.

Note: Exceptions include minor tool changes, adjustments, and other minor servicing activities which take place during normal production operations. They are not covered by this program if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection.

This program does not apply to the following:

1. Work on cord and plug connected electrical equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by the unplugging of the equipment from the energy source and the plug being under the exclusive control of the employee performing the servicing and/or maintenance.
2. 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 the employer demonstrates that:
 - a. Continuity of service is essential.
 - b. Shutdown of the system is impractical.
 - c. Documented procedures are followed.
 - d. Special equipment is used which will provide proven effective protection for employees.

Section 4. Definitions

Affected employee: An employee whose job requires them to operate or use a machine or equipment on which servicing and/or maintenance is being performed under LO/TO, or whose job requires them to work in an area in which such servicing and/or maintenance is being performed.

Authorized employee: A person who locks out or tags out machines or equipment in order to perform servicing and/or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing and/or maintenance covered in this program.

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. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

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

Energy isolating device: A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. 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 energy.

Hot tap: A procedure used in the repair, maintenance, and services activities which involves welding on a piece of equipment (*pipelines, vessels, or tanks*) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

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 a machine or equipment. Includes blank flanges and bolted slip blinds.

Normal production operations: The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up: Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout: The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device: A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Section 5. Roles and Responsibilities

Specific responsibilities for carrying out this program are identified by position below.

Provosts:

- Support and provide resources for the overall program.

Campus Safety Officers:

- Review the written program annually.
- Evaluate and review the program effectiveness.
- Assist the NHED Safety Administrator in ensuring program elements are implemented across the campus.

NHED Safety Administrator:

- Ensure annual review, evaluation, and necessary updates to the program.
- Ensure that employee training records and required records are maintained.

Deans/Supervisors:

- Oversee the program for their departments/work areas.
- Oversee employee training.
- Ensure that the LO/TO program is followed.
- Evaluate and review the program effectiveness.
- Provide resources for required equipment and PPE.
- Responsible for department/work area LO/TO procedures, including identification of equipment, selection and acquisition of lockout devices, and design of LO/TO and verification procedures.
- Ensure procedures are developed for multiple LO/TO requirements.
- Designate responsibilities for authorized employees involved with group lockout.
- Ensure that new equipment is assessed for LO/TO and develop appropriate procedures.

Employees:

- Comply with the requirements of this program and follow all LO/TO procedures.
- Understand the hazards and related safe work practices.
- Wear all necessary PPE to perform tasks safely.
- Attend required training sessions.

Section 6. Lockout/Tagout Procedures and Techniques

Preparation for Lockout

Procedures are to be developed, documented, and utilized for the control of potentially hazardous energy. (See *exception below*).

Exception: Procedures are not needed for a particular machine or equipment when all of the following elements exist:

- 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 source which can be readily identified and isolated.
- The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
- The machine or equipment is isolated from that energy source and locked out during servicing and/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 and/or maintenance.
- The servicing and/or maintenance does not create hazards for other employees.
- There have been no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing and/or maintenance.

The established procedures for the application of energy control (*the lockout or tagout procedures*) must cover the following elements and actions and is to be completed in the following sequence:

LO/TO Steps

- Step 1: Before an authorized employee turns off a machine or equipment, the authorized employee 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. They must notify all affected employees that LO/TO is going to be used and reasons why.
- Step 2: The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
- Step 3: Energy isolating devices that are needed to control the energy to the machine or equipment must be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).
- Step 4: Lockout devices must be affixed by the authorized employee in a manner that will hold the energy isolating devices in a "safe" or "off" position. Tagout devices, where used by an authorized employee, must be affixed in a manner that clearly indicates that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

- Step 5: Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.
- Step 6: Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee must verify that isolation and de-energization of the machine or equipment have been accomplished.

Multiple Locks

When servicing and/or maintenance is performed by a crew, craft, department, or other group, they must use a procedure that affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

Each authorized employee must affix their personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when beginning work and may verify that any and all energies are properly controlled before beginning work. Authorized employees must remove their devices when they stop working on the machine or equipment being serviced and/or maintained.

Shift or Personnel Change

In the event of a shift or personnel change, the on-coming authorized employee must affix their personal lock to the energy isolating device prior to the off-going authorized employee removing theirs, in order to ensure continuity of the lockout or tagout protection. This procedure will minimize exposure to hazards from the unexpected energization or startup of the machine or equipment, or the release of hazardous energy. The on-coming authorized employee may verify that any and all energies are properly controlled before beginning work.

Use of Tagout

Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock. When a tag is attached to an energy isolating means by an authorized employee, it is **never** to be removed, bypassed, ignored, or otherwise defeated.

Note: The use of tagout has many limitations and is not recognized as having the same level of protection as a positive lockout system. If an energy isolating device is capable of being locked out, then a lockout system must be utilized, unless it can be demonstrated that the tagout system will provide full employee protection in accordance with this program.

Where an energy isolating device is not capable of being locked out, an effective tagout system must be utilized. When a tagout device is used on an energy isolating device, which is capable of being locked out, the tagout device must be attached at the same location that the lockout device would have been attached. It must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use. Where a tag cannot be affixed directly to the energy isolating device, the tag must 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.

Whenever major replacement, repair, renovation or modification of machines or equipment is made, and whenever new machines or equipment are installed, energy isolation devices must be designed to accept lockout devices.

Release from LO/TO

Before lockout or tagout devices are removed and energy is restored to the equipment, the following steps must be taken:

- Step 1: Inspect work area to ensure that machine components are intact and non-essential items (*tools, equipment, etc.*) have been removed.
- Step 2: Ensure that all employees are out of danger and notify affected employees of startup.
- Step 3: Each lockout or tagout device must be removed by the authorized employee who applied the device. (*See exception below*).
- Step 4: Start equipment to ensure proper operation.

Testing of Positioning of Machines, Equipment, or Components

If the machine or equipment must be tested or repositioned and lockout or tagout devices are to be temporarily removed, steps 1-3 must be followed. After energizing to perform testing or positioning is completed, all systems must be de-energized and the LO/TO procedure must be repeated.

Lockout or Tagout Device Removal Exception

Each lockout or tagout device must only be removed from each energy isolating device by the authorized employee who applied the device. When the authorized employee that applied the lockout or tagout device is not available to remove it, that device may be removed through the following procedure:

- Step 1: Verify that the authorized employee, who applied the lockout or tagout device, is not on the campus.
- Step 2: Make all reasonable efforts to contact the employee.
- Step 3: Remove the lockout or tagout device in accordance with the procedure.
- Step 4: Ensure that the authorized employee has this knowledge before they resume work to prevent reoccurrence.

Section 7. Training

Employees required to use LO/TO are to be trained in the following areas:

- 1. Recognition of applicable hazardous energy sources.
- 2. Types and magnitude of the energy available in the workplace.
- 3. The methods and means of energy isolation and control.
- 4. The purpose and use of the energy control procedure.
- 5. If tagout systems are used, employees are to also be trained in the limitations of tagout.

Retraining or refresher training is to be provided if:

1. There is a change in the job assignments.
2. There is a change in machines, equipment, or processes that result in a new hazard.
3. There is a change to the energy control procedure.
4. There is a reason to believe that an employee does not have the skill or understanding to effectively use LOTO.

Awareness training is to be provided to affected employees that may be in an area where energy control procedures are utilized to prevent the unauthorized energization or startup of machines or equipment which are locked out or tagged out.

Records of training are to be documented and retained for a minimum of 3 years. Training documentation includes:

1. Date and location of training.
2. Names of employees attending and their signatures.
3. Name and title of person conducting the training.
4. Brief summary of material covered.

Section 8. Outside Personnel (Contractors, etc.)

Whenever outside servicing personnel are to be involved in activities covered by the scope and application of this program, the campus Safety Officer, Facility Maintenance Supervisor, and/or other knowledgeable campus representative and the outside contractor must inform each other of their respective lockout or tagout procedures.

The campus Safety Officer, Facility Maintenance Supervisor, and/or other knowledgeable campus representative must ensure that affected employees understand and comply with the restrictions and limitations of the outside employer's energy control program.

Section 9. Program Review

Annual reviews of the LO/TO program and periodic inspections of procedures are to be conducted and documented, including any changes or additions to the program or other related documents.