



Subject: The Control of Hazardous Energy (Lockout Tagout)	Date: 3/23/2023
EH&S Program: Occupational Safety	Next Review: 03/23/2024
Scope: University Wide	Original: 2009

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Responsible Department/Division/Committee:

Environmental Health and Safety

Policy:

Equipment that has the potential of being energized, activated or operated, during service or maintenance activities, shall be assessed prior to the start of work to ensure that all sources of energy and potential hazards are properly identified and secured in accordance with the procedure established by this policy.

Definitions:

Affected Employee: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee: A person who locks out or tags 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 covered under this section.

Capable of Being Locked Out: An energy isolating device which has a hasp or other means of attachment to which, or through which a lock can be affixed.

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.

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

Group LOTO: A lockout that occurs when more than one employee will be performing maintenance on a single piece of equipment simultaneously.

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 unique device that utilizes a positive means such as a lock, either key or combination type, to hold an energy-isolating device in a safe position and prevent the energizing of a machine or equipment meeting the requirements of LOTO procedures.

Primary Authorized Employee: An authorized employee who has overall responsibility for meeting the requirements of LOTO procedures.

Qualified Person: A person designated by the department as having the training, knowledge and experience for that job 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 un-jamming of machines or equipment and making adjustments to tool changes, where the employee may be exposed to startup of the equipment or release of hazardous energy.

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 fastened securely 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.

Procedures:

A. Responsibility:

1. Departments are responsible for implementing the requirements of this policy, including, but not limited to:
 - a. Perform assessments and develop written standard operating procedures (S.O.P.) that document specific procedural steps for performing LOTO.
 - b. Maintain an inventory of equipment in their department that requires equipment specific standard operating procedures (S.O.P.).
 - c. Provide LOTO devices (tags, locks and/or any other hardware) for isolating, securing or blocking of machines or equipment.
 - d. Identify affected/authorized employees and ensure they receive LOTO training prior to performing work on equipment that requires LOTO.
 - e. The supervising department shall continually monitor employee performance with regard to compliance with this procedure and shall correct any deviations or inadequacies observed.
 - f. When a machine or other equipment is replaced or repaired, renovated or modified, or newly installed, departments must ensure that it is designed and/or capable of accepting a LOTO device.
 - g. At least annually, supervising departments shall conduct a review of their energy control program and update as required.

2. Department of Environmental Health & Safety
 - a. Provide LOTO training to all University personnel that are involved in the operation, servicing and maintenance of machines and equipment in which the unexpected startup of the equipment or release of stored energy could cause injury.
 - b. Assist departments with their assessments and review of their energy control procedures.
 - c. Provide recommendations for policy changes and equipment used to perform LOTO.

B. Written Energy Control Procedure

1. Departments must develop, document and use specific procedures to control potentially hazardous energy when employees are servicing equipment or machinery.

2. Specific procedures are not required for a particular machine or equipment, when all of the following elements exist:
 - a. The machine or equipment has no potential for stored or residual energy, or for re-accumulation of stored energy after shut down, which could endanger employees.
 - b. The machine or equipment has a single energy source that can be readily identified and isolated, de-energized and/or deactivated.
 - c. The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
 - d. A single lockout device will achieve a lockout condition.
 - e. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
 - f. The servicing or maintenance does not create hazards for other employees. The department has had no accidents involving the unexpected activation or reenergizing of machines or equipment during servicing or maintenance.

3. Specific procedures, when required, shall include the following information:
 - a. Purpose statement of the intended use of the procedure;
 - b. Scope to identify the equipment involved;
 - c. Specific procedural steps for shutting down, isolating blocking and securing machines or equipment to control hazardous energy;
 - d. Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and
 - e. Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.
 - 1) If electrical isolation is performed, a qualified person shall use test equipment (voltage meter) to ensure that electrical power has been isolated from the equipment. This shall be performed using the Live-Dead-Live process (Note: this process is used to verify that the voltmeter is working properly before and after circuit voltage testing. It is accomplished by first checking a known energized "Live" circuit, then test the de-energized "Dead" circuit to be worked on, and lastly, the meter should be re-verified from a known source to ensure that it has not failed during the circuit confirmation process, hence the term "Live).

4. Lockout/Tagout Sequence for: The following steps shall be incorporated into specific procedures and shall be used for LOTO of devices that do not require specific procedures.
 - a. Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

- b. Review the type and magnitude of the energy sources involved with this machine or equipment with affected employees.
 - c. If the machine or equipment is operating, shut it down by normal stopping procedure (depress the stop button, open switch, close valve, etc.).
 - d. Deactivate the energy isolation device(s) so that the machine or equipment is isolated from the energy source(s).
 - e. Place a lock and tag on the energy isolating device(s).
 - f. Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.
 - g. The machine or equipment is now locked out.
5. Restoring equipment to Service: When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.
- a. Check the machine or equipment and the immediate area around the machine or equipment to ensure components are operationally intact.
 - b. Check the work area to ensure that all employees have been safely positioned or removed from the area.
 - c. Verify that the controls are in neutral.
 - d. Remove the lockout devices and reenergize the machine or equipment.
Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.
 - e. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.
6. Removal of LOTO Devices by Others:
- a. LOTO devices may only be removed by the employee that applied the device. Whenever work is being performed, under group LOTO, outside the normal shift or working hours a primary authorized employee must be present at all times.
 - b. When changing shifts, the supervising department may, through an orderly transfer, designate a new primary authorized employee. This new primary authorized employee must attach their personal lockout device to the group lockout device or LOTO box before the previous authorized employee removes their lockout device.
 - c. Whenever work is being performed over a period of time and is not continuous, the primary authorized employee shall walk through the affected work area(s) to verify effective isolation protection prior to beginning work.

7. Outside Personnel:
 - a. Whenever outside servicing personnel (contractors) are to be engaged in activities covered by the scope and application of this policy, the supervising department and the outside employer shall inform each other of their respective LOTO procedures.
 - b. The supervising department shall ensure that his/her personnel understand and comply with restrictions and prohibitions of the outside employer's energy control procedures.
 - c. The supervising department shall ensure that all outside personnel have been properly trained in accordance to OSHA 29CFR 1910.147 "The Control of Hazardous Energy."

8. Group LOTO Requirements:
 - a. When servicing and or maintenance is performed by a crew, craft, department or other group, a procedure shall be utilized which affords the employees a level of protection equivalent to that provided by implementation of a personal LOTO device. Group lockout shall be utilized where complex LOTO operations involve many employees and numerous energy-isolating devices.
 - b. The primary authorized employee must implement and coordinate the LOTO of hazardous energy sources and verify that the steps taken, in accordance with the specific written energy control procedure, have in fact isolated the machine or equipment effectively from the hazardous sources. This must be accomplished before authorized employees participating in the group LOTO affix their personal lockout device.
 - c. Each authorized employee shall affix a personal LOTO device to the group lockout device, group lockbox, or comparable mechanism before he or she begins work, and shall remove those devices when he or she finishes working on the machine or equipment being serviced or maintained.

9. Shift or Personnel Changes:
 - a. Whenever work is being performed under group LOTO, outside the normal shift or working hours a primary authorized employee must be present at all times. When changing shifts, the supervising department may, through an orderly transfer, designate a new primary authorized employee. This new primary authorized employee must attach their personal lockout device to the group lockout device or LOTO box before the previous authorized employee removes their lockout device.
 - b. Whenever work is being performed over a period of time and is not continuous, the primary authorized employee shall walk through the affected work area(s) to verify effective isolation protection prior to beginning work.

10.LOTO Devices

- a. LOTO devices shall be standardized in at least one of the following criteria: color, shape, or size: and additionally, for tagout devices print and format shall be standardized.

11.Training

- a. Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the types and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
- b. Each affected employee shall be instructed in the purpose and use of the energy control program.
- c. All other employees whose work operations are or may be in the area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition of relating to attempt to restart or re-energize machines or equipment which are locked out or tagged out.

Forms: NA

Policy Cross Reference: NA

Relevant Standards/Codes/Rules/Regulations/Statutes:

29 CFR 1910.147 *The Control of Hazardous Energy (Lock Out/Tag Out)*

ANSI Z-244.1-2003 *Safety Requirement for the Lock Out/Tag Out of Energy Sources*

NFPA 70E Latest Version *Standard for Electrical Safety in the Workplace*

References and Resources: NA



Appendix A

PROTECTIVE MATERIALS AND HARDWARE

LOTO devices must be standardized and singularly identified and the only device(s) used for controlling energy, and shall not be used for other purposes. In addition LOTO devices shall:

1. Be capable of withstanding the environment conditions to which they are exposed for the maximum period of time that exposure is expected.
2. Be standardized in at least one of the following criteria: color, shape, or size; and additionally, in the case of tagout devices, print and format shall be standardized.
3. Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolts cutters or other metal cutting tools.
4. Tagout devices including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal.
5. Tagout attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.
6. LOTO devices shall indicate the date installed and the identity of the employee(s) applying the device(s).
7. Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: "*Do Not Start*", "*Do Not Open*", "*Do Not Energize*", or *Do Not Operate.*"