

H. Control of Hazardous Energy: Lockout/Tag Out

1. Purpose

Control of Hazardous energy is the purpose of the Lockout- Tagout Program. This program establishes the requirements for isolation of both kinetic and potential electrical, chemical, thermal, hydraulic and pneumatic and gravitational energy prior to equipment repair, adjustment or removal. Reference: OSHA Standard 29 CFR 1910. 147, the control of hazardous energy.

2. Definitions

Authorized (Qualified) Employees are the only ones certified to lock and tagout equipment or machinery. Whether an employee is considered to be qualified will depend upon various circumstances in the workplace. It is likely for an individual to be considered “qualified” with regard to certain equipment in the workplace, but “unqualified” as to other equipment. An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered to be “qualified” for the performance of those duties.

Affected Employees are those employees who operate machinery or equipment upon which lockout or tagging out is required under this program. Training of these individuals will be less stringent in that it will include the purpose and use of the lockout procedures.

Other Employees are identified as those that do not fall into the authorized, affected or qualified employee category. Essentially, it will include all other employees. These employees will be provided instruction in what the program is and not to touch any machine or equipment when they see that it has been locked or tagged out.

3. Training

- a. Authorized Employees Training.
- b. All Maintenance Employees, Department Supervisors and Janitorial employees will be trained to use the Lock and Tag Out Procedures. The training will be conducted by the Maintenance Supervisor or Safety Coordinator. Retraining shall be held at least annually.
- c. Affected Employee Training
 - i. Only trained and authorized Employees will repair, replace or adjust machinery, equipment or processes.
 - ii. Affected Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits.
- d. Other Employee Training
 - a. Only trained and authorized Employees will repair, replace or adjust machinery or Equipment.

- b. Other Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits

4. Preparation for Lock and Tag Out Procedures

- a. A Lockout – Tagout survey has been conducted to locate and identify all energy sources to verify which switches or valves supply energy to machinery and equipment. Dual or redundant controls have been identified.
- b. A Tagout Schedule has been developed for each major piece of equipment and machinery. This schedule describes the energy sources, location of disconnects, type of disconnect, special hazards and special safety procedures. The schedule will be reviewed each time to ensure employees properly lock and tag out equipment and machinery. If a Tagout Schedule does not exist for a particular piece of equipment, machinery and process, one must be developed prior to conducting a Lockout – Tagout. As repairs and/or renovations of existing electrical systems are made, standardized controls will be used.

5. Routine Maintenance & Machine Adjustments

Lock and Tag Out procedures are not required if equipment must be operating for proper adjustment. This rare exception may be used only by trained and authorized Employees when specific procedures have been developed to safely avoid hazards with proper training. All consideration shall be made to prevent the need for an employee to break the plane of a normally guarded area of the equipment by use of tools and other devices.

6. Locks, Hasps, And Tags

All Qualified Maintenance Personnel will be assigned a lock with one key, hasp, and tag. All locks will be keyed differently, except when a specific individual issues a series of locks for complex lockout-tagout tasks. In some cases, more than one lock, hasp and tag are needed to completely de-energize equipment and machinery. Additional locks may be checked out from the Department or Maintenance Supervisor on a shift-by-shift basis. All locks and hasps shall be uniquely identifiable to a specific employee.

7. Sop: General Lock and Tag Out Procedures – Shutdowns

- a. Before working on, repairing, adjusting or replacing machinery and equipment, the following procedures will be utilized to place the machinery and equipment in a neutral or zero mechanical state.
- b. Before authorized or affected employees turn off a machine or piece of equipment, the authorized employee will have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the means to control the energy.
- c. Notify all affected Employees that the machinery, equipment or process will be out of service
- d. The machine or equipment will be turned or shut down using the specific procedures for that specific machine. An orderly shutdown will be utilized to avoid any additional or increased hazards to employees as a result of equipment de-energization.

- e. If the machinery, equipment or process is in operation, follow normal stopping procedures (depress stop button, open toggle switch, etc.).

8. Machine or Equipment Isolation

- a. All energy control devices that are needed to control the energy to the machine or equipment will be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.
- b. Move switch or panel arms to “Off” or “Open” positions and close all valves or other energy isolating devices so that the energy source(s) is disconnected or isolated from the machinery or equipment.

9. Lockout or Tagout Device Application

- i. Lockout or tagout devices will be affixed to energy isolating devices by authorized employees.
- ii. Lockout devices will be affixed in a manner that will hold the energy isolating devices from the “safe” or “off” position.
- iii. Where tagout devices are used they will be affixed in such a manner that will clearly state that the operation or the movement of energy isolating devices from the “safe” or “off” positions is prohibited.
- iv. The tagout devices will be attached to the same point a lock would be attached. If the tag cannot be affixed at that point, the tag will be located as close as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.
- v. Lock and tag out all energy devices by use of hasps, chains and valve covers with assigned individual locks.

10. Stored Energy

- a. Following the application of the lockout or tagout devices to the energy isolating devices, all potential or residual energy will be relieved, disconnected, restrained, and otherwise rendered safe.
- b. Where the re-accumulation of stored energy to a hazardous energy level is possible, verification of isolation will be continued until the maintenance or servicing is complete.
- c. Release stored energy (capacitors, springs, 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.

11. Verification of Isolation

- a. Prior to starting work on machines or equipment that have been locked or tagged out, the authorized employees will verify that isolation or de-energization of the machine or equipment have been accomplished.
- b. After assuring that no Employee will be placed in danger, test all lock and tag outs by following the normal start up procedures (depress start button, etc.).

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- c. Caution: After Test, place controls in neutral position.
- d. Special Electrical Note: Check Voltage as part of testing procedures.

12. Extended Lockout – Tagout

Should the shift change before the machinery or equipment can be restored to service, the lock and tag out must remain. If the task is reassigned to the next shift, those Employees must lock and tag out before the previous shift may remove their lock and tag.

13. Release from Lockout/Tagout

Before lockout or tagout devices are removed and the energy restored to the machine or equipment, the following actions will be taken:

- a. The work area will be thoroughly inspected to ensure that nonessential items have been removed and that machine or equipment components are operational.
- b. The work will be checked to ensure that all employees have been safely positioned or removed. Before the lockout or tagout devices are removed, the affected employees will be notified that the lockout or tagout devices are being removed.
- c. Each lockout or tagout device will be removed from each energy isolating device by the employee who applied the device.

14. Loto Procedure for Electrical Plug-Type Equipment

This procedure covers all Electrical Plug-Type Equipment such as Battery Chargers, some Product Pumps, Office Equipment, Powered Hand Tools, Powered Bench Tools, Lathes, Fans, etc. When working on, repairing, or adjusting the above equipment, the following procedures must be utilized to prevent accidental or sudden startup:

- a. Unplug Electrical Equipment from wall socket or in-line socket.
- b. Attach “Do Not Operate” Tag on Plug Box & Lock on end of power cord. An exception is granted to not lock & tag the plug is the cord & plug remain in the exclusive control of the Employee working on, adjusting or inspecting the equipment.
- c. Test Equipment to assure power source has been removed by depressing the “Start” or “On” Switch.
- d. Perform required operations.
- e. Replace all guards removed.
- f. Remove Lock & Plug Box and Tag.
- g. Inspect power cord and socket before plugging equipment into power source. Any defects must be repaired before placing the equipment back in service.

15. Loto Procedures Involving More Than One Employee

In the preceding SOPs, if more than one Employee is assigned to a task requiring a lock and tag out, each must also place his or her own lock and tag on the energy isolating device(s) unless crew/craft LOTO procedures are used.

16. Management's Removal of Lock and Tag Out

Only the employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the employee leave the facility before removing his/her lock and tag, the maintenance manager/supervisor may remove the lock and tag. The maintenance manager/supervisor must be assured that all tools have been removed, all guards have been replaced and all employees are free from any hazard before the lock and tag are removed and the machinery, equipment or process are returned to service. Notification of the employee who placed the lock is required prior to lock removal.

17. Contractors

Contractors, working on University property and equipment must use a Lockout – Tagout procedure while servicing or maintaining equipment, machinery, or processes. Office of Environmental Health and Safety (EHS) and Facility Services shall be notified of the details of the Contractors program.