



Cleveland Clinic

Buildings + Properties – Facilities Engineering

Lock Out/Tag-Out Standard Operating Procedure

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Purpose

The Lock Out/Tag out Standard Operating Procedure establishes the minimum requirements for the lock out and tagging of energy isolating devices. It is used to ensure that the machine or equipment is isolated from all potentially hazardous energy and locked out and tagged before employees perform any servicing or maintenance activities where the unexpected energizing, start-up or release of stored energy could cause injury or death.

Definitions

Cleveland Clinic health system locations: Includes the main campus, Avon, Euclid, Fairview, Hillcrest, Lutheran, Marymount, Medina, South Pointe, Children's Hospital for Rehabilitation and all Family Health Centers, Physician practice sites, Nevada practice sites, Emergency Departments, Urgent Care Centers and Ambulatory Surgical Centers reporting to these facilities.

ACTIVATION/ENERGIZATION - To set machinery into motion by starting, switching, pushing, moving, or otherwise engaging power sources for such equipment. To provide a flow of electricity or complete a circuit that is the main power source for the machinery/equipment. Machines and equipment are energized when they are connected to an energy source or when they contain residual or stored energy.

AFFECTED EMPLOYEE - An employee whose job requires him/her to operate or use equipment on which servicing or maintenance is being performed under lock out or tag out, 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 equipment in order to perform servicing or maintenance on that 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 is considered capable of being locked out if it meets one of the following requirements:

- Is designed with a hasp which allows a padlock or other suitable locking device.
- Is designed so any other integral part allows a locking mechanism.
- Has a built in locking mechanism.

Locking out is accomplished without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

ENERGY CONTROL PROCEDURES - A written document that contains those items of information an authorized employee needs to know in order to safely control hazardous energy during servicing or maintenance of equipment.

ENERGY CONTROL PROGRAM - A program intended to prevent the unexpected energization or the release of stored energy in equipment. The program consists of energy control procedures, an employee training program, and periodic inspections.

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 an 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, gravity or other energy.

HAZARDOUS MOTION - Motion of equipment under mechanical stress or gravity that may abruptly release and cause injury. Hazardous motion may result even after power sources are disconnected. Examples are coiled springs, raised hydraulic equipment, capacitors and any sources of potential energy that may cause injury.

LOCK OUT - The placement of a lock out device on an energy isolating device with the use of a hasp (lock-out tree), in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lock out device is removed.

LOCK OUT DEVICE - A lock with a hasp (lock out tree), that uses a positive locking means such as (key or combination type) and a hasp (lock out tree), to hold an energy-isolating device in a safe position, thereby preventing the energization of equipment. When properly installed a blank flange or bolted slip blind are considered equivalent to lock out devices.

NORMAL PRODUCTION OPERATIONS - The utilization of an equipment to perform its intended purpose.

QUALIFIED PERSON - A person permitted to work on or near exposed energized parts.

SERVICING AND /MAINTENANCE - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and /or servicing equipment. These activities include lubrication, cleaning or unjamming of equipment and making adjustments or tools changes, where the employee is exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

SETTING UP - Any work performed to prepare equipment to perform its normal production operation.

TAG OUT - The practice of using tags in conjunction with locks to increase the visibility and awareness that equipment is not to be energized or activated until such devices are removed. Tags, along with hasp (lock out tree), are required to be used on every lock out project and are to

contain the following information: authorized lock out person's name, date, phone number and description of the service or maintenance being done.

TAG OUT DEVICE - Any prominent warning device, such as a tag and a means of attachment such as a hasp (lock out tree), secured to an energy-isolating device. The tag indicates that the equipment to which it is attached is not to be operated until the Tag out device is removed in accordance with the energy control procedure.

Instructions

All Facilities Engineering employees intending to initiate a Lock Out/Tag out of any energized equipment are required to follow this Standard Operating Procedure (SOP).

1. Scope and Application

The Occupational Safety and Health Administration (OSHA) standard for the control of hazardous energy (Lock out/Tag Out), Title 29 Code of Federal Regulations (CFR) section 1910.147 addresses the practices and procedures necessary to de-energize equipment or machinery in order to prevent harm to an employee as a result of the unexpected or uncontrolled discharge or release of hazardous energy during a planned maintenance or service order. The standard addresses measures for controlling hazardous energy which include but not limited to electrical, mechanical, hydraulic, pneumatic, chemical, thermal, and nuclear.

This program applies to the control of energy during servicing and/or maintenance of machines and equipment. Normal production operations are not covered by this program. Servicing and/or maintenance which take place during normal production operations is covered by this standard only if:

- An employee is required to remove or bypass a guard or other safety device; or
- An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation); or
- The employee is required to place any part of his or her body into a danger zone associated with a machine operating cycle.

Employees performing minor tool changes, adjustments, and/or other minor servicing activities that are routine, repetitive, and integral to the use of the production equipment are not covered by this program if the activity occurs during normal production operations. However, alternative measures that provide effective protection must be used.

It is the practice of the Cleveland Clinic Enterprise that any individual engaging in the maintenance, repairing, servicing, or adjusting of equipment will abide by the procedures outlined in this document. This program is designed to meet or exceed applicable codes. Lock out/tag out shall be used to ensure that the energized equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing or

maintenance where the unexpected energization or start-up of the equipment or release or stored energy could cause injury. All employees, upon observing a piece of equipment which is locked out to perform servicing or maintenance, shall not attempt to start, energize, or use that equipment.

Lock out is a first means of protection; lock out tags only supplement the use of locks. The Cleveland Clinic Enterprise requires the use of a hasp (lock-out tree) to supplement the lock and the tag.

Tag out alone may be used only when the application of a lock is not practically feasible and only with approval of the department leader. This shall be a rare occasion.

2. Responsibilities

Facility Manager

- Ensure that the lock out/tag out procedures are in compliance with regulatory requirements.
- Certify that periodic inspections have been performed (see Section 8.0, Recordkeeping and Appendix A, Annual Lock out/Tag out Inspection/Retraining Checklist and Certification).
- Require all new equipment be provided with Lock out/Tag out procedures before they are maintained and/or shut down.
- Ensure that each leader and employee adheres to procedures.

Shop Supervisor / Lead Person

- Ensure that each employee and each on-site contractor engaging in work requiring locking/tagging out of energy sources understands and adheres to these procedures.
- Assure that affected and authorized employees have received training in energy control procedures prior to operating the equipment.
- Provide the prescribed annual training to applicable employees.
- Provide and maintain necessary equipment and resources such as tags, locks, hasp (lock-out tree), and/or other similarly effective means.
- Where applicable, incorporate operation specific lock out/tag out procedures. The forms provided in Appendix B & C, Energy Source Evaluation and Machine/Operation Specific Lock out/Tag out Procedure shall be used. [See 29CFR 1910.147 (c)(4)(i) exceptions and 29CFR 1910.147 (d) for applied energy control].
- Notify Facility Manager of new or revised equipment or operations that require the use of lock out/tag out devices during servicing, maintenance, or repair.
- Inspect energy control procedures and practices, before each use to ensure that general and specific lock out procedures are being followed.
- Inspections must be carried out by persons other than those employees directly utilizing energy control procedures.

- Inspections will include a review between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
- Maintain a file of equipment lock out procedures for all equipment requiring energy sources to be locked out / tagged out per this standard operating procedure.

EMPLOYEES

- Adhere to procedures as outlined in this document for all tasks that require the use of lock out procedures.
- Maintain lock out/tag out supplies in good condition. Neatly and accurately fill out tags.
- Promptly report ALL issues relating to lock out/Tag out process to department leaders.

3. Lock out/Tag out Procedures

BASIC RULES FOR LOCK OUT/TAG OUT

All equipment shall be locked out, per the “Lock Color Scheme”, by CCF employees. (Appendix D) and as available by contractors. This standard operating procedure and the applicable equipment procedure will be followed to protect against accidental operation which could cause injury or death to personnel. (See Section 1.3 for exceptions.)

Equipment with multiple energy sources requires specific procedures for the control of these multiple energy sources. Specific equipment procedures will be referenced and followed, or if none are available, specific equipment procedures will be written and approved before any work requiring lock out/tag out begins. (Appendix B and Appendix C)

SEQUENCE OF LOCK OUT PROCEDURE

Obtain permission to isolate and lock out equipment from the facility responsible for the operation of the system affected. The facility responsible for the operation of the affected equipment will work directly with the energy system specialist by isolating the equipment and each placing their lock(s), hasp (lock-out tree), and tag(s) on the affected equipment.

For all equipment shutdowns, the authorized employee shall refer to the specific equipment procedures to neutralize, or control, all the energy sources of that equipment. These procedures will provide understanding of the hazards, and the methods to control all the potential energy sources.

If the equipment is operating, the facility responsible for the operation of the system shall shut it down by the normal shutdown procedure (depress the stop button, open switch, close valve, etc.).

Ensure that the equipment is disconnected from all energy sources by first checking that no personnel are exposed, and then verify isolation of the equipment by operating the push button or other normal operating controls to make certain the equipment will not operate. CAUTION: Return operating control(s) to neutral or off position after the test.

Lock out the energy isolating device(s) with the assigned lock(s) (Appendix D), lock out tags per this standard operating procedure, and the applicable equipment procedure.

The equipment is now locked out. Verify that the equipment cannot release any form of energy that may harm personnel working on the equipment.

RESTORING EQUIPMENT TO NORMAL OPERATIONS

After the servicing and/or maintenance are complete and equipment is ready for normal operations, check the area around the machines or equipment to ensure that no one is exposed. After all tools have been removed from the equipment, guards have been reinstalled and employees are in the clear, remove all lock out/tag out devices. Verify that the potential energy “relief” is put back into normal operating position. Operate the energy isolating devices to restore energy to the equipment.

Notify affected employees that the servicing or maintenance is completed and the equipment is ready for use.

PROCEDURE INVOLVING MORE THAN ONE PERSON

In the preceding steps, if more than one individual is required to lock out or tag out equipment, each shall place his/her own personal lock out/tag out device on the energy isolating device(s) by utilizing the hasp (lock-out tree).

A single lock may be used to lock out the equipment with the key being placed in a lock out box or cabinet which allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet. As each person no longer needs to maintain his or her lock out protection, that person will remove his/her lock from the box or cabinet.

REMOVAL OF ABSENT EMPLOYEES LOCK OUT/TAG OUT DEVICE

Only the authorized employee who applied a lock out/tag out device will remove it. If the authorized employee is not available to remove the lock, the department leader may do so as long as:

- i. Verification that the authorized employee is not at the facility is made and documented.
- ii. The authorized employee is contacted prior to the start of their next shift and informed that their lock out/tag out device has been removed.

4. Additional Lock out/Tag out Procedures

CORD AND PLUG CONNECTED EQUIPMENT

If servicing or maintenance is performed on cord and plug connected equipment the following procedure shall be performed to protect employees:

- Unplug equipment from its electrical socket.

- Place a lockable cover over the plug and a lock on the plug cover during equipment servicing or maintenance.

LOCK OUT OF ELECTRICAL EQUIPMENT, CIRCUITS, OR PARTS

- Safe procedures for de-energizing circuits and equipment shall be determined before circuits or equipment are de-energized.
- The circuits and equipment to be worked on shall be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, may not be used as the sole means for de-energizing circuits or equipment. Interlocks for electric equipment may not be used as a substitute for lock out and tagging procedures.
- Stored electric energy which might endanger personnel shall be released. Capacitors shall be discharged and high capacitance elements shall be short-circuited and grounded.
 - Note: If the capacitors or associated equipment are handled in meeting this requirement, they shall be treated as energized.
- Stored non-electrical energy in devices that could reenergize electric circuit parts shall be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.
- Apply lock out devices as described above.
- A qualified person shall operate the equipment controls or otherwise verify that the equipment cannot be restarted.
- A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately after this test.
- A qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that the circuits and equipment can be safely reenergized.
- Approval must be obtained from the department head prior to any work on energized circuits. Facilities Management Policy 2.29, [Electrical Safe Working Practices Standard Operating Procedure](#) for Cleveland Clinic Enterprise will be followed.

5. Testing Or Positioning Of Machines, Equipment, Or Components

- Situations in which lock out devices must be temporarily removed from the energy isolating device and the equipment energized to test or position the equipment or component thereof must be coordinated through the person who locked out the device. The following sequence of actions shall be followed:
 - Clear the machine or equipment of tools and materials;
 - Remove employees from the equipment area;
 - Authorized personnel to remove the lock out/tag out devices;
 - Energize and proceed with testing or positioning;
 - De-energize all systems and reapply energy control measures in accordance with paragraph 5.2 of this section to continue the servicing and/or maintenance.
- Approval must be obtained from the department head prior to any work on energized equipment.

6. Outside Contractors

The Cleveland Clinic lead contact will inform all outside contractors of the elements of this program and ensure that work efforts covered by this procedure are fully communicated and coordinated. If machinery being maintained by an outside contractor will affect Cleveland Clinic authorized employees, the contractor must submit the pertinent lock out procedures to the department supervisor/manager for approval.

7. Training

- **EMPLOYEE TRAINING** Employees will receive annual lock out/tag out training. Note: Training requirements outlined in 29CFR [Specifically 1910.147 (c)(7)(i),(ii), & (iii)].
- **RECORDKEEPING / INSPECTION RECORDS** Department Supervisors/Managers will maintain all lock out inspection records in accordance with this Standard Operating Procedure.
- **TRAINING RECORDS** Training records will be maintained by Department Supervisors/Managers. Training records will include an outline of topics covered and a record of those employees attending.

Regulatory Requirements/References

Code of Federal Regulations, Title 29, Part 1910, Section 147 and Section 333.2.

- http://www.antiochcollege.edu/sites/default/files/attachedFiles/AC_LO_TO_Program_1.pdf (accessed 07/27/2017)

CCF Standard Operating Procedure: Electrical Safe Working Practices

CCF Standard Operating Procedure: Safe Practices on De-Energizing High Voltage Circuits

Oversight and Responsibility

Buildings + Properties is responsible to review, revise, update, and operationalize this standard operating procedure to maintain compliance with regulatory or other requirements.

Appendices (click on bell, or link is below)

Appendix A - [Annual Lock out/Tag out Inspection/Retraining Checklist and Certification](#)

Appendix B - [Annual Lock out/Tag out Energy Source Evaluation](#)

Appendix C – [Machine/Operation Specific Lock out/Tag out Procedure](#)

Appendix D – [LOTO Color Designations and Use](#)