

California Institute of Technology

Lockout/Tagout Program



Caltech Environmental Health and Safety Office
1200 E. California Blvd., M/C B125-6
Pasadena, CA 91125
Phone: 626.395.6727
Fax: 626.577.6028

Email: safety@caltech.edu Website: www.safety.caltech.edu

TABLE OF CONTENTS

TABLE OF CONTENTS	2
PURPOSE	3
SCOPE	3
RESPONSIBILITIES	3
Facilities Supervisors	3
Environmental Health and Safety	3
DEFINITIONS	4
CLEANING, SERVICING, AND ADJUSTING OPERATIONS	4
REPAIR WORK AND SETTING-UP OPERATIONS	4
HAZARDOUS ENERGY CONTROL PROCEDURES	5
Lockout/Tagout	5
Verification of Lockout	5
Testing Energized Equipment during a Lockout/Tagout	5
Steps to Restart	6
Group Lockout/Tagout	6
Shift or Personnel Changes	6
Removing an Authorized Employee’s Lock	6
Periodic Inspections	7
TRAINING	7
Authorized Employee	7
Affected Employee	7
APPENDIX A:	8
CENTRAL UTILITY PLANT GROUP LOCKOUT/TAGOUT AND SHIFT OR PERSONNEL CHANGES	8
Group Lockout/Tagout, Multiple Locked Points	8
Shift Worker, Specific Operating Areas Lockout/Tagout	8

PURPOSE

The purpose of the Lockout Tagout Program is to ensure that lockout tagout (LOTO) is implemented at Caltech to eliminate hazards from the workplace in compliance with Cal/OSHA Title 8, California Code of Regulations (CCR), § 3314.

SCOPE

This written Program applies to the cleaning, repairing, servicing, setting up, and adjusting of machines and equipment in which the unexpected energization or start-up of the machines or equipment, or release of stored energy could cause injury to employees.

Cleaning, repairing, servicing, and adjusting activities shall include unjamming prime movers, machinery, and equipment. Servicing energized electrical systems procedures are also referenced in the [Caltech Electrical Safety Program for Campus Facilities](#).

Employees and contractors are required to comply with Caltech's Lockout Tagout Program.

RESPONSIBILITIES

Facilities Supervisors

- Ensure that all Authorized Employees have received training in the significance, purpose, and procedures of the Lockout Tagout Program.
- Each Authorized employee shall be instructed in the purpose and use of specific energy control procedure(s).
- Ensure that all Authorized Employees are provided with the proper LOTO and Personal Protective Equipment (PPE) to perform the job safely.
- Ensure that only Authorized Employees perform lockout/tagout work.
- Conduct or delegate annual energy control procedure inspections of Authorized Employees to ensure compliance with the requirements of the Cal/OSHA lockout/tagout standard and this Institute Program.
- Write equipment-specific lockout/tagout procedures as appropriate.

Authorized Employees

- Review training in the significance, purpose, and procedures of the Lockout Tagout Program.
- Review equipment-specific lockout/tagout procedures.
- Instruct each Affected Employees of the purpose and use of the energy control procedure.

Environmental Health and Safety

- Conduct periodic review of the Lockout Tagout Program.

DEFINITIONS

Affected Employee - An employee whose job requires them to operate or use machinery or equipment on which cleaning, repairing, servicing, setting-up, or adjusting operations are being performed under lockout/tagout, or whose job requires the employee to work in an area in which such activities are being performed under lockout/tagout.

Authorized Employee – A qualified person who locks out or tags out specific machines or equipment in order to perform cleaning, repairing, servicing, setting-up, and adjusting operations on that machine or equipment. An Affected Employee becomes an Authorized Employee when that employee’s duties include performing cleaning, repairing, servicing, setting up, or adjusting operations covered under this section.

Locked Out – The use of devices, positive methods and procedures, which will result in the effective isolation or securing of prime movers, machinery, and equipment from mechanical, hydraulic, pneumatic, chemical, electrical, thermal, or other hazardous energy sources.

Normal Production Operations – The utilization of a machine or equipment to perform its intended production function.

Prime Mover – The source of mechanical power for a machine.

Tagout – The placement of a tagout device on an energy-isolating device to indicate that the machinery or equipment being controlled cannot be operated until the tagout device is removed.

CLEANING, SERVICING, AND ADJUSTING OPERATIONS

- Machinery or equipment capable of movement shall be stopped and their power source(s) de-energized or disengaged.
- Accident prevention signs, tags, or both shall be placed on the controls of the power source(s) of the machinery or equipment.
- If necessary, the moveable parts must be mechanically blocked, in addition to being locked out to prevent inadvertent movement, or release of stored energy.

REPAIR WORK AND SETTING-UP OPERATIONS

- Machines, equipment, and prime movers shall be locked out in the "OFF" position if they have lockable controls (or are readily adaptable to lockable controls).
- Machines, equipment, and prime movers shall be de-energized or disconnected from their power source(s) (or other actions taken to effectively prevent inadvertent movement or release of stored energy) if they do not have lockable controls on the power source(s) of the machinery or equipment.
- Accident prevention signs, tags, or both shall be placed on the controls of the power source(s) of the machinery or equipment.

HAZARDOUS ENERGY CONTROL PROCEDURES

These procedures apply to the cleaning, repairing, servicing, setting up, and adjusting of machines and equipment in which the unexpected energization or startup of the machines or equipment, or release of stored energy, could cause injury to employees.

Lockout/Tagout

1. Inform all Affected Employees that lockout/tagout work will be performed in their area. If appropriate, the Authorized Employee will request the Service Center issue a Utility and Service Interruption Notice.
2. If the machinery or equipment is operating, shut it down as described in the safe operating procedures (e.g., press the stop button, open the switch, close the valve, etc.).
3. Access the energy-isolating device, such as a manually operated circuit breaker, and switch it to the "OFF" position.
 - *Important Note: Push buttons, selector switches, software controls, interlocks, and other control circuit devices are not considered energy-isolating devices.*
4. Lock out each of the energy-isolating devices with a lock, hasp, and an assigned individual warning tag showing the shutdown date. This may include unplugging the equipment and locking it out using an approved lockable cover on the electrical plug.
5. When placing a lock is not possible, an assigned individual warning tag must be used along with another means of disconnecting the circuit, machine, or equipment.

Verification of Lockout

1. Isolate the immediate work area by vacating all unnecessary personnel.
2. Dissipate all forms of stored energy (e.g., compressed air pressure in a line).
3. Verify that all types of energy sources have been isolated or disconnected.
4. Test energy-isolating devices by trying to operate the machine or equipment using the normal operating controls (e.g., press the start button).
5. Verify that the machinery or equipment is at a zero-energy state.

Testing Energized Equipment during a Lockout/Tagout

In some instances, machinery or equipment must be energized during lockout/tagout work to tune, adjust, or make measurements before the machine or equipment is returned to service.

In these situations, an Authorized Employee must do the following:

1. Remove all unnecessary tools and equipment from the immediate work area.
2. Clear all unnecessary personnel from the immediate work area.
3. Remove the lockout/tagout device(s) and energize the machinery or equipment.
4. Make the necessary adjustments or measurements following safe and recommended procedures.

Steps to Restart

1. Reinstall, adjust, and secure all machine or equipment guards or guarding devices.
2. Remove all tools and parts from the immediate work area.
3. Isolate the immediate work area by vacating all unnecessary personnel.
4. Inform all Affected Employees in the immediate work area about the planned startup of the machine or equipment.
5. Remove all locks, hasps, and assigned individual warning tags or other energy- isolating devices.
6. Energize all energy sources.
7. Start machinery or equipment following normal operating procedures.

Group Lockout/Tagout

1. Department or group lockout/tagout devices shall be used following the procedures required above.
2. An Authorized Employee shall determine potential exposure to group members during the lockout/tagout process.
3. An Authorized Employee shall have primary responsibility for the employees working under the protection of the group lockout/tagout device.
4. When multiple departments or groups are involved in the lockout/tagout process, an Authorized Employee will be assigned responsibility to control all affected work personnel to ensure lockout/tagout procedures are being followed.
5. Each Authorized Employee shall attach a personal lockout/tagout device to a group lockbox or multi-lock hasp when they begin work and shall remove the lockout/tagout device at the end of their shift.

Shift or Personnel Changes

Departments or groups shall establish specific hazardous energy control procedures (i.e., lockout/tagout) that will be utilized during shift or personnel changes to ensure the continuity of lockout/tagout protection including, but not necessarily limited to, procedures for the orderly transfer of lockout/tagout device protection between outgoing and incoming personnel.

Removing an Authorized Employee's Lock

If an employee is unable to remove his/her lockout device due to not being at work, then the responsible Supervisor must make an attempt to contact the employee to unlock and remove the lockout/tagout device. If the machinery or equipment is ready to be put back into service, and the employee is unavailable to unlock and remove the lockout/tagout device, then the responsible Supervisor is authorized to cut and remove the lock from the energy-isolating device.

Upon return to work, the employee whose lockout/tagout device was removed must be notified and informed about the status of the machinery or equipment that was locked/tagged out.

Periodic Inspections

Periodic inspections of a department's lockout/tagout procedures will be performed at least annually to evaluate the effectiveness of the procedures and determine whether the procedures need to be updated.

1. The periodic inspections will be conducted by a Supervisor or an Authorized Employee, knowledgeable in lockout/tagout, who is not involved with the machine or equipment being utilized and inspected under the lockout/tagout procedures.
2. The periodic inspections will include a review between the inspector and Authorized Employee(s) of their responsibilities under the lockout/tagout procedures being inspected. The Periodic Lockout/Tagout Inspection Form is provided in the Aim work order phase created to do the inspection.
3. The Authorized Employee or Supervisor performing the inspection will certify that the inspection has been performed. The certification will include the following information:
 - a. The identification of the machine or equipment on which the lockout/tagout procedures are being utilized (asset number if available).
 - b. The date of the inspection.
 - c. The name(s) of the Authorized Employee(s) performing the lockout/tagout procedures during the inspection.
 - d. The name of the person performing the inspection.

TRAINING

Authorized Employee

Employees shall be trained on hazardous energy control procedures and on the hazards related to performing activities required for cleaning, repairing, servicing, setting up, and adjusting of prime movers, machinery, and equipment.

Affected Employee

Affected Employees are those employees affected by the shut down or who work in areas where equipment is being serviced or maintained. Affected Employees shall be instructed in the following:

- Purpose and use of the Lockout/Tagout procedures.
- How to recognize Lockout/Tagout equipment.
- Prohibition on tampering with Lockout/Tagout equipment, including attempts to restart, or reenergize machines and/or equipment which are locked out or tagged out.

APPENDIX A:

CENTRAL UTILITY PLANT GROUP LOCKOUT/TAGOUT AND SHIFT OR PERSONNEL CHANGES

Group Lockout/Tagout, Multiple Locked Points

1. Department or group lockout/tagout devices shall be used following the procedures required above.
2. An Authorized Employee shall determine potential exposure to group members during the lockout/tagout process.
3. An Authorized Employee shall have primary responsibility for the employees working under the protection of the group lockout/tagout device.
4. With multiple lockout/tagout points, each point shall be secured using a lock from a designated set of keyed-alike locks; there shall be only one key common to these locks.
5. The single key shall be placed inside a lockable box to which multiple locks can be used to secure it. All people involved with the event requiring the lockout will use their own lock to prevent access to the single key.
6. Except for the lock from the Authorized Employee responsible for the event, locks should be removed at the end of each work shift or when no longer involved with the event, per item #8.
7. When multiple departments or groups are involved in the lockout/tagout process, an Authorized Employee will be assigned responsibility to control all affected work personnel to ensure lockout/tagout procedures are being followed.
8. Each Authorized Employee shall attach a personal lockout/tagout device to a group lockbox or multi-lock hasp when they begin work and shall remove the lockout/tagout device at the end of his/her shift.

Shift Worker, Specific Operating Areas Lockout/Tagout

1. Department or group lockout/tagout devices shall be used following the procedures required above.
2. An Authorized Employee shall determine potential exposure to group members during the lockout/tagout process.
3. An Authorized Employee shall have primary responsibility for the employees working under the protection of the group lockout/tagout device.
4. Shift workers in certain areas shall use locks designated for their use.
5. The single key to these locks shall be transferred between shift workers until such time when service personnel can exchange the shift worker lock with their own.

* * *