

# **Chapter 16 – Lock Out/Tagout**

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## 16.1 Foreword

It is the policy of the County of Santa Clara to prevent an undesirable release of hazardous energy during any servicing, maintenance, or modification activity. This policy is implemented through the Lockout/Tagout (LOTO) described in this chapter. These procedures must be strictly followed when it is necessary to work on any equipment that may release any form of hazardous energy including, but not limited to, electrical, rotational, mechanical, chemical, hydraulic, or pneumatic energy, while the equipment is shut down.

LOTO is required whenever cleaning, servicing, repairing, , setting-up, adjusting, maintenance or modification is being performed on machines or equipment in which the unexpected energization or startup of the machines or equipment, or the release of stored energy, could cause injury to people or damage to equipment. Activities shall include unjamming prime movers, machinery and equipment. All sources of hazardous energy must be shut off and secured. LOTO must be performed by each person who works on the equipment.

## 16.2 Introduction

These Lockout and tag out (LOTO) procedures describe how employees can protect themselves against unexpected energy releases. Per Cal/OSHA requirements under 8 CCR 3314, the LOTO procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance, including but not limited to, the following:

- A statement of the intended use of the procedure;
- The procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
- The procedural steps for the placement, removal and transfer of lockout devices and tagout devices and responsibilities; and,
- The requirements for testing a machine or equipment, to determine and verify the effectiveness of lockout devices, tagout devices and other hazardous energy control devices.

In summary, the procedures will outline how the employee can securely isolate machines, equipment, or confined spaces from hazardous energy sources. This document is part of the County's written Occupational Injury and Illness Prevention Program.

## 16.3 Roles and Responsibilities

### 16.3.1 Agency/Department Head

- Ensures the implementation of the lockout program in the Agency/Department
- Allocates sufficient resources to supervisors to fully implement the lockout program.
- Ensures that supervisors receive proper training.
- Support program changes where needed to improve program efficiency and effectiveness.

### 16.3.2 Supervisor

- Receives training on the LOTO program • Provides new and existing employees with approved lockout and tagout equipment

- Identifies task(s) and equipment for lockout.
- Ensures that lockout procedures are written for all applicable equipment
- Provides training...
  - for new employees before they use equipment.
  - annually as a refresher for all employees.
  - whenever work processes change.
- Enforces lockout compliance.
- Conduct periodic inspections on other employees lockout activities.
- Documents periodic inspections.

### **16.3.3 Employee**

- Maintains a thorough knowledge of the operating systems to be locked out.
- Receives training on the lockout/tagout program
- Follows lockout procedures whenever necessary.
- Tells his or her supervisor of concerns about lockout hazards.

### **16.3.4 Agency/Department Safety Coordinator**

- Helps supervisors establish a LOTO program.
- Coordinates basic LOTO program training with CEO - OSEC.
- Informs CEO - OSEC of any lockout hazard.

### **16.3.5 ESA - OSEC**

- Assists Agency/Department in the development of a lockout/tagout (LOTO) program.
- Oversees the LOTO program implementation, evaluation and modification per Cal/OSHA updates.
- Coordinates LOTO training and information sharing among departments.
- Assist supervisors and the purchasing department with the purchase of protective and LOTO equipment.
- Reviews Workers' Compensation reports on injury rates related to energy release and recommends corrective action.

### **16.3.6 Purchasing**

- Ensures that new or overhauled equipment can accommodate locks and tags.

- Works with ESA - OSEC to standardize locks, tags, and warning signs.

### **16.3.7 Construction Project Manager**

- Reviews outside contractor's LOTO procedures to ensure Cal/OSHA compliance.
- Informs outside contractors of the County's LOTO Procedures.

## **16.4 Identifying Hazards**

A variety of tasks in construction, facility maintenance, and equipment repair can involve an unexpected energy release. In general, individual employees are the best ones to determine which tasks could place them at risk. By giving careful consideration to all potential energy sources, each employee should be able to work with their supervisor to identify energy release hazards specific to their job or work site.

Examples of situations that require lockout, tag, and testing include:

- Adjusting or repairing power tools & equipment.
- Working on wiring.
- Working on pressurized pipes and tanks.
- Entering confined spaces.
- Working near compressed or expanded springs.
- Working in or near empty pipes, passages or tanks that might unexpectedly fill with liquid or gas.
- Maintaining or servicing any equipment that may release energy.

Supervisors must work with employees to develop a list of equipment and tasks that require lockout procedures. Make sure that each piece of equipment is permanently labeled with a message such as, "Lockout and Tag required when working on this equipment."

## **16.5 Equipment Survey**

Supervisors must work with employees to locate and identify all switches, valves or other energy isolating devices that need to be locked out and tagged. Use Appendix A or a similar form to make a record of the survey. More than one energy source (electrical, mechanical, or others) may be involved.

Hazardous energy control procedure shall include separate procedural steps for the safe lockout/tagout of each machine or piece of equipment affected by the hazardous energy control procedure.

Although it may seem that certain valves or switches cannot be locked out, a wide variety of specialized lockout devices are commercially available, and others can be improvised. If the equipment or lines cannot be shut down or locked out, employees should coordinate with their supervisor to develop a specific safe job procedure – and follow it carefully.

## **16.6 Exclusions**

LOTO procedures do not apply under the following conditions:

1. Minor tool changes and adjustments and other minor servicing activities that take place during normal production operations if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures that provide effective protection.

Note: This exclusion does not apply under the following conditions:

- If an employee is required to remove or bypass a guard or other safety device; or
  - If an employee is required to place any part of his/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
  - Where an associated danger zone exists during a machine operation cycle.
2. Work on cord and plug-connected electrical equipment, if unplugging the equipment controls all the energy, and the plug remains under the continuous control of the employee performing the servicing, maintenance, or modification.
  3. Hot tap operations that involve 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:
    - Continuity of service is essential, and
    - Shutdown of the system is impractical, and
    - Documented procedures are followed, and special equipment is used that will provide proven, effective protection for employees.
  4. Electrical systems less than 50 volts to ground that do not increase exposure to electrical burns or to explosion due to electrical arcs.

## 16.7 Labels, Tags and Lock Out Devices

### 16.7.1 Labels

Supervisors should assure that labels and signs are placed permanently near critical switches, valves, etc. A label might say something like, “**DANGER – Use lockout device during maintenance.**” Pre-printed labels are commercially available.

### 16.7.2 Lock Out Devices

Lock Out Devices fit over plugs, switches, valves, etc. to prevent inadvertent opening or switching on. Most lockout devices are designed to accept a padlock. If an employee works around energy, that employee should have been issued their own individual lock and key or be able to check out a lock for the duration of the task. That way, only the employee performing LOTO can open the lock. Employees must never use the lockout padlock for any other purpose. Only properly trained employees shall have personal locks.

### 16.7.3 Tags

Whenever an employee uses a lock on a switch, valve, etc., they must attach a tag to the lock that explains why the lock is there. DO NOT USE A TAG WITHOUT ALSO USING A LOCK. The following requirements apply to all tags:

- Tags must have a “signal word” (Caution, Warning, or Danger) and a message, such as “DO NOT START”. Use “Danger” tags only in situations where an immediate hazard presents a threat of death or serious injury.
- The tag shall be readable at a minimum distance of five feet (or farther if necessary).
- The tag's major message shall be presented in pictographs, written text or both.
- The “signal word” and the major message shall be understandable to all employees who may be exposed to an energy release hazard.
- Tags shall use string, wire, or adhesive to prevent their loss or unintentional removal.

## 16.8 Lockout Procedures

If a piece of machinery or equipment is capable of movement or a release of energy, the employee must de-energize or disengage it and lock it out during cleaning, servicing, adjusting or set-up.

### 16.8.1 Performing a lock out

- Tell all affected employees which machines or pieces of equipment that are going to be locked out, and why.
- If the machine or equipment is operating, shut it down by the normal procedure (use the stop button, switch, etc.) and release any residual energy.
- Turn off circuit breakers, valves, or other energy isolating devices so that the equipment is isolated from its energy source(s). Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as blocking, bleeding down, etc.
- Lock the energy isolating devices with the assigned personal lock. Make sure the proper locking devices are used.
- Tag the locks. Make sure the tags cannot fall off.
- After ensuring that nobody is exposed, test the equipment by operating the start button or other controls to make *sure* the equipment will not operate. REMEMBER TO RETURN THE CONTROLS TO THE “OFF” POSITION AFTER THE TEST.
- The equipment is now locked out, tagged and tested.

### 16.8.2 Procedure Involving More than One Person

When a crew works on de-energized equipment, each crew member must be protected by putting his or her individual lock on a device that also accepts the other members’ locks. That way, energy cannot be restored until each crew member has finished his or her task, cleared the area, and removed his or her lock. Use a

multiple lockout device (hasp) if the energy isolating device cannot accept multiple locks. An alternative is to use a single lock to lockout the machine or equipment and put the key in a box or cabinet which accepts multiple locks. If the employee or employees use such a box, they must make sure that they strictly control duplicate keys for the single lock that is on the machine. Supervisors must place one person in charge of each multi-person lockout. Provide multi-lock hasps as needed.

### **16.8.3 During the lock out period**

Supervisors shall keep a list of all employees who are working on locked out equipment. Employees shall:

- Perform the necessary service or maintenance.
- Do not try to operate any switch, valve, or other energy isolating device when it is locked or tagged.

### **16.8.4 Shift Work and Transfer of Authority**

To maintain a lockout during shift or personnel changes, supervisors shall make sure that those who applied locks either remove them at the end of the shift or transfer them to oncoming employees.

### **16.8.5 Restoring Machines or Equipment to Normal Production Operations**

- Do not remove any lock or tag you did not personally install.
- After the repair or maintenance is done and the equipment is ready for normal operation, check the area to make sure no one is exposed.
- After all tools have been removed from the machine or equipment, guards have been reinstalled, and employees are in the clear, verify that all operator controls are off.
- Remove all locks and tags.
- Operate the switches, valves, etc. to restore energy.
- Check to be sure everything is working properly.

## **16.9 Contractors**

Whenever an outside contractor works in your area, the supervisor will inform each other of their respective lockout procedures, and make sure that the contractor follows whichever lockout procedure is jointly decided upon.

## **16.10 Training**

Only employees who are trained and authorized can perform LOTO.

### **16.10.1 Who Should Receive Training**

1. County employees who perform LOTO and County managers who have employees directly reporting to them and perform LOTO are required to receive training.
2. Construction contractors must show written records of formal LOTO training. The County contracting officer will enforce the specification section for noncompliance if records of equivalent training cannot be produced, or if LOTO procedures are found not to be in compliance with this document.



## **16.10.2 Authorization**

- The supervisor provides specific authorization after the employee satisfies the training requirements. The supervisor must ensure that the employee is thoroughly familiar with the equipment (within the context of his/her job function) and with the energy-control procedures. The supervisor shall provide additional on-the-job training if the employee is not thoroughly familiar with the equipment and/or written procedure.
- When satisfied that both the training and authorization requirements have been met, the supervisor may authorize an employee to perform LOTO. This authorization stipulates the specific equipment or types of equipment on which the authorized employee may perform LOTO. Each supervisor must maintain records of authorized employees, and the type of on-the-job training that was given.

## **16.10.3 Reauthorization and Retraining**

LOTO reauthorization is required when:

- An authorized employee's job changes or if he/she is reassigned.
- New equipment is to be used.
- New energy-control procedures are to be implemented.

LOTO retraining and/or reauthorization is required when:

- A supervisor has reason to believe that an employee has inadequate knowledge of LOTO procedures or policy.
- A periodic inspection shows a deficiency in the authorized employee's ability to implement LOTO policy correctly.

## **16.10.4 Training shall cover:**

- How to recognize energy sources.
- Types and magnitude of energy sources.
- Methods of energy isolation and control.
- How to shut down, isolate, and block or secure specific machines or equipment.
- How to place, remove and transfer lockout devices or tags.
- Testing a machine or equipment to determine the effectiveness of locks and other energy control devices.
- Where the written lockout program is kept. (It must be available for employee review).

## **16.11 Recordkeeping**

Supervisors shall maintain records of the following:

- Training records. Include employee's name, title, dates of training, and subject matter covered.

- An inventory of locks and keys as they are assigned to employees.
- Inspections.

## 16.12 Inspections

Supervisors shall perform periodic inspections and evaluations of the LOTO program. Rather than perform a separate inspection for lockout procedures, supervisors may simply add a few lockout items to regular inspection checklists. Inspection items should ensure that:

- Each employee who needs one has (or has access to) a personal lock.
- Those employees understand their lockout responsibilities.
- Labels and signs are posted where needed.
- Tags, locking devices, and other needed equipment (such as multi-lock hasps) are available to employees.
- Employees are using lockout procedures.
- The machines or equipment involved are listed.
- The employees contacted are listed.
- The date and the inspector's name are recorded.

Supervisors shall keep inspection records at the work site for three years as required by Cal/OSHA

## 16.13 References

29CFR1910.147, "The Control of Hazardous Energy (lockout/tagout)", 1989

NIOSH "Guideline For Controlling Hazardous Energy During Maintenance and Servicing", Publication Number 83-125, 1983

ANSI, Z244.1-1982 "American National Protection-Lockout/Tagout of Energy Sources-Minimum Safety Requirements"

## 16.14 Glossary

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

*Authorized employee or person.* 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 including performing cleaning, repairing, servicing, setting-up and adjusting operations covered under this section.

**Capable of being locked out** An energy isolating device that has a built-in lock or that can accommodate a lock or hasp.

**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 slide gate; a slip blind; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch, and other normal operating controls.

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

**Hot tap** A procedure 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 uses a positive means such as a lock to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Can include locks, tags, chains, wedges, key blocks, adapter pins, self locking fasteners, or other hardware used to isolate, secure or block machines or equipment from energy sources.

**Normal operations** The use of a machine or equipment for its intended function.

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

**Tag (verb)** The placement of a tag 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 tag is removed.

**Tag (noun)** A prominent warning device 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 tag is removed.

## 16.15 Appendices

**16.15.1 Appendix A: Lockout/Tagout Equipment Survey**

**Equipment Survey**

Equipment	Type of Stored Energy	Where will lock be placed?	Test Methods