# Lockout / Tagout



**INCIDENT**

At approximately 3:00 p.m. on November 28, 2007, Employee #1 was working as a foreman for an electrical contractor that was installing panels, transformers, and lighting into a newly-constructed single-story commercial building in Hawthorne, CA. At the time of the accident, he was completing the installation of electrical panels in the building's electrical meter room. Employee #1 was apparently working alone and he was discovered by coworkers on the ground in the panel room, next to a 480-volt pull panel from which the cover had been removed. The coworkers contacted Emergency Services. One of the firemen later stated that the 480-volt pull panel was energized and that one energized conductor was hanging loose in the panel. Employee #1 was transported to the Little Company of Mary Hospital, where he was pronounced dead at 4:55 p.m.

The County of Los Angeles Coroner's report listed the cause of death as electrocution, from contact with energized electrical equipment due to the lack of proper work procedures, safeguards, and barriers, and the lack of personal protective equipment. **The employer was cited for a violation, regulatory, of T8CCR 342(a), for failing to report a serious accident; for a violation, general, of T8CCR 1509(b), for the lack of a code of safe practices for electrical work; and an accident-related violation, serious, of T8CCR 2320.2(a), for work on energized equipment without proper procedures.**

**NEED TO KNOW**

Employees servicing or maintaining machines or equipment may be exposed to serious physical harm or death if hazardous energy is not properly controlled. Craft workers, machine operators, and laborers are among the 3 million workers who service equipment and face the greatest risk.

The four-page general industry standard (29 CFR 1910.147), published in September 1989, was designed to prevent the accidental start-up of machines or other equipment during maintenance and servicing. Under the rule, hazardous energy sources must be **"isolated and rendered inoperative"** before work can begin. **Hazardous energy sources include electrical, mechanical, hydraulic, pneumatic, chemical, thermal or, as in the Ravenswood case, plain gravity.**

**BUSINESS / REGULATION**

The OSHA standard for **The Control of Hazardous Energy (Lockout/Tagout), Title 29 Code of Federal Regulations (CFR) Part 1910.147**, addresses the practices and procedures necessary to disable machinery or equipment, thereby preventing the release of hazardous energy while employees perform servicing and maintenance activities. The standard outlines measures for controlling hazardous energies—electrical, mechanical, hydraulic, pneumatic, chemical, thermal, and other energy sources. In addition, **29 CFR 1910.333** sets forth requirements to protect employees working on electric circuits and equipment. This section requires workers to use safe work practices, including lockout and tagging procedures. These provisions apply when employees are exposed to electrical hazards while working on, near, or with conductors or systems that use electric energy.

OSHA requires an annual audit of authorized personnel by an observer who will ensure that each associate follows the lockout/tagout procedure correctly, including putting locks in the right places, testing the machine for active energy sources and warning others to stay away from the equipment.

OSHA also requires annual audits of written lockout procedures to identify changes in the machinery that may have rendered any documented procedure obsolete and to ensure regular refreshes of LOTO processes.

**STATISTICS**

Lockout/Tagout (LOTO) was one of OSHA's top ten cited violations for 2017. Given that it's estimated LOTO prevents 120 deaths and over 50,000 worker injuries each year, this is a critical part of every EHS program and should be leveraged to its fullest potential. Workers injured on the job from exposure to hazardous energy lose an average of 24 days for recuperation.

In FY2016, the Occupational Safety and Health Administration received reports of 868 amputations caused by workplace incidents nationwide. Each and every one of these life-altering accidents was preventable.

**PREVENTION**

**Responsibilities of Employers**

The lockout/tagout standard establishes the employer's responsibility to protect employees from hazardous energy sources on machines and equipment during service and maintenance.

This is generally done by affixing the appropriate lockout or tagout devices to energy-isolating devices and by deenergizing machines and equipment.

**Employees need to be trained**

The training must cover at least three areas:

- aspects of the employer's energy control program;
- elements of the energy control procedure relevant to the employee's duties or assignment; and
- the various requirements of the OSHA standards related to lockout/tagout.

**How Do Employers Protect Workers?**

- Develop, implement, and enforce an energy control program.
- Use lockout devices for equipment that can be locked out. Tagout devices may be used in lieu of lockout devices only if the tagout program provides employee protection equivalent to that provided through a lockout program.
- Ensure that new or overhauled equipment is capable of being locked out.
- Develop, implement, and enforce an effective tagout program if machines or equipment are not capable of being locked out.
- Develop, document, implement, and enforce energy control procedures.
- Use only lockout/tagout devices authorized for the particular equipment or machinery and ensure that they are durable, standardized, and substantial.
- Ensure that lockout/tagout devices identify the individual users.
- Establish a policy that permits only the employee who applied a lockout/tagout device to remove it.
- Inspect energy control procedures at least annually.
- Provide effective training as mandated for all employees covered by the standard.
- Comply with the additional energy control provisions in OSHA standards when machines or equipment must be tested or repositioned, when outside contractors work at the site, in group lockout situations, and during shift or personnel changes.

**Six Tips to Improve Your Lockout/Tagout**

1. **Choose the Right Devices**

Industrial machines, circuit breakers, plugs, switches, push buttons, and valves are just some of the items that often require lockout devices. There are two considerations that will help: necessity (knowing exactly what you need) and organization (using standardized devices and tools to help keep your devices organized).

First, determine exactly what you need. Create a list of all machines or electrical components that may need lockout devices.

Second, standardize and organize your lockout devices. Lockout Stations are one effective way to store and organize necessary devices.

2. **Thoroughly Document Procedures**

Lockout procedures need to be formally documented. This will keep workers and management on the same page and help to eliminate any potential confusion. Formal documentation is required by OSHA but, given the differences in workplaces and machines, not every procedure will be the same.

Procedures should thoroughly detail the steps needed to shut down and isolate hazardous energy. The procedures also should describe how to safely place and remove all relevant lockout/tagout devices.

Procedures should be posted near the relevant machine. Machine-specific photographs detailing each step are highly recommended.

3. **Clearly Mark All Isolation Points**

All energy control points should be clearly and permanently marked with standardized tags or labels.

Tags and labels should be easily visible. It is also very important to make sure all energy isolation points are consistent with the machine-specific procedures.

4. **Develop a Rigorous Training Program**

Effective training is an indispensable part of a successful lockout program.

First, it is important for each worker to know exactly what his role is. Tasks should be clearly defined and clearly assigned to the appropriate worker. There are three types of workers involved in lockout operation: authorized, affected, or other. An **authorized** employee is directly involved in locking out equipment or machinery. An **affected** employee means any employee whose work is affected by a lockout. Usually, this means an employee who is working on locked out equipment. An employee is classified as **other** if he or she does not work on the machine receiving maintenance or repair but still works in the same area.

Each worker needs to know what type of employee he is, and strong communication needs to be developed among all workers. **Authorized employees** must clearly alert all affected employees when a lockout device is placed or removed. In order to prevent unsafe removal of devices, only authorized employees can remove devices that they have placed. Lockout padlocks have room for workers to clearly write their names in permanent ink, which underscores the strong need for clear assignments and individual responsibility.

As with procedures and isolation points, **Documentation** is an important component of training. Recording exactly what types of training have occurred is helpful on several levels. **First**, it helps management make sure that all workers have been trained, as well as trained in the right tasks. Any gap in training can be easily found and corrected. **Second**, it documents when training took place. If you know when your last training session took place, it is easier to plan when the next one should take place. **Last**, looking at documentation of lockout training can help one see one’s program from a new, more objective perspective. Suggestions can then be taken into account and improvements can be made.

OSHA requires that lockout/tagout training occur at least annually. Yearly training should be seen as a bare minimum rather than an ideal. In many cases, it would be helpful to revisit training exercises more frequently than yearly in order to ensure that critical repairs and maintenance are still being done safely. Also, repeat training helps workforces keep a “safety first” mentality.

5. **Evaluate**

Careful evaluation is an invaluable tool for improvement. Evaluation is necessary to make sure that the training exercises, procedures, and devices are working properly.

Inspections need to occur at least annually and should be performed by an **Authorized Employee** who is not involved in the procedure being inspected. Any and all deviations must be corrected and all roles must be thoroughly reviewed.

The date of inspection, procedures, the machines and equipment involved, and the names of all workers involved in the inspection must be recorded.

6. **Evolve**

A good lockout program should always be able to evolve; OSHA may introduce more requirements or more stringent guidelines.