

LOCKOUT/TAGOUT HANDOUT

OSHA's hazardous energy standard, commonly known as the "lockout/tagout standards" is intended to prevent these frequent injuries which result from the unexpected startup of machines while they are being serviced or repaired. The standard also is designed to protect employees from unexpected electrical or other energy discharges from machines while they are undergoing repair or service.

LOCKOUT/TAGOUT ACCIDENTS

An employee was using a cloth rag to clean dirt from an electrical control panel (breaker box). His left hand contacted an energized part and the employee was electrocuted. The employee failed to shutoff power and lockout the power source before contacting it.



A maintenance employee was working on a machine. He was inside the machine, backing up bolts after the intended maintenance had been completed. Another employee started the machine before the employee finished, and was crushed and killed. The employee failed to lockout the machine prior to climbing inside. The second employee had no idea the employee was inside the machine

An employee working with a machine saw that scrap material was accumulating which threatened to jam the machine. She reached over the guard to remove the material when the machine cycled, amputating her right index finger. The employee failed to lockout the equipment because she thought she could remove the material before the machine cycled.



LOCKOUT/TAGOUT REQUIREMENTS

Employers are required to use "lockout" and "tagout" devices to protect workers during maintenance and servicing operations. A lockout is a locking device, such as a padlock, that is placed on a switch, valve, or lever to prevent accidental machine startups or energy releases. A tagout is a written warning informing employees not to operate a switch or other mechanism that could set a machine in motion or release hazardous energy.

- Before any employee performs any maintenance or repair of a machine or equipment where unexpected start up or release of stored energy could occur, the machine or equipment should be isolated, and rendered inoperative.

- If an energy isolating device is capable of being locked out, then it should be locked out and tagged out. If an energy isolating device is not capable of being locked out, then a tagout should be used.

- Stored Energy

- Following the application of lockout and/or tagout to energy isolating devices, all potentially hazardous stored energy should be relieved, disconnected, restrained, and otherwise rendered safe.



- Verification and Work

- Prior to starting work on machines or equipment that has been locked out and/or tagged out; the employee shall verify that isolation and de-energization of the machine or equipment has been accomplished. Once the machine/equipment is safe, the work can be accomplished.

- Release from Lockout/Tagout



- Before lockout/tagout devices are removed and energy is restored to the machine or equipment, the work area should be inspected to ensure that non-essential items have been removed, components of the machine or equipment are operationally intact, and all employees have been safely positioned or removed.

- After lockout/tagout devices have been removed and before machine or equipment is started, affected employees should be notified that lockout/tagout devices have been removed.

- Each lockout/tagout device should be removed by the employee who applied the device.

- Training

- All employees should receive training in lockout/tagout devices and procedures, and the prohibition relating to attempt to restart or reenergize machines or equipment which have been locked out or tagged out.

Forms of Hazardous Energy

Mechanical Energy (also known as *kinetic energy*) refers to the actual movement of equipment components or materials.

Stored Energy (also known as *potential energy*) can be released as mechanical (*kinetic*) energy if it is not properly controlled. There are several types of stored energy that are common, including:

- **The potential for gravity** or other mechanical movement
 - Suspended, elevated or coiled materials
 - Springs, which can be under tension or compression
- **Fluids under pressure** – includes gases or liquids, such as these:
 - Pressure vessels
 - Gas tanks
 - Hydraulic systems
 - Pneumatic systems
 - Steam lines
 - Chemical piping

Stored energy can be handled in several ways:

- **Items subject to gravity** or mechanical movement can be either blocked or released.
- **Fluids under pressure** can be blocked, dissipated or released.
 - But **don't** release them directly into the atmosphere if they are toxic, flammable or explosive substances.

Electrical Energy can occur in a number of forms, such as:

- Electrical power
- Static electricity
- Electrical storage devices
- Batteries
- Capacitors – store electrical energy: they must be discharged before work begins.

Thermal Energy can occur in high or low temperature systems. Some of the sources of thermal energy include:

- Heated water
- Steam
- Mechanical work
- Radiation
 - Non-ionizing radiation, such as: lights, lasers, microwaves
 - Ionizing radiation, such as: X-rays
- Chemical reaction
- Electrical resistance

Combinations of many of the above forms of energy are common in industrial equipment.

SOURCES: *Searching for the Switch to Locking Out*
Canadian Auto Workers Union.

Preventing Worker Deaths from Uncontrolled Release of Electrical, Mechanical and Other Types of Hazardous Energy
US Dept of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. DHHS (NIOSH) Publication No. 99-110, August 1999.