LOCKOUT/TAGOUT

Lockout/tagout procedures are designed to prevent accidents and injuries caused by the unexpected release of energy when equipment is being repaired or maintained.

WHERE ARE THE REGULATIONS?

The Occupational Safety and Health Administration (OSHA) regulates lockout/tagout through the Control of Hazardous Energy standard, found at 29 CFR 1910.147. This standard mandates training, audits, and recordkeeping to ensure that workers will not be injured by unintentionally energized equipment. Reference this section if needed as a guide.

WHAT IS LOCKOUT/TAGOUT?

Lockout is the process of preventing the flow of energy from a power source to a piece of equipment, and keeping it from operating.

Lockout is accomplished by installing a lockout device at the power source so that equipment powered by that source cannot be operated. A lockout device is a lock, block, or chain that keeps a switch, valve, or lever in the off position.

Locks are provided by the employer and can be used only for lockout purposes. They should never be used to lock tool boxes, storage sheds, or other items.

Tagout is accomplished by placing a tag on the power source. The tag acts as a warning not to restore energy - it is not a physical restraint. Tags must clearly state: **Do not operate** or the like, and must be applied by hand.

Both locks and tags must be strong enough to prevent unauthorized removal and to withstand various environmental conditions.

WHAT MUST BE LOCKED OR TAGGED OUT

The lockout/tagout standard covers servicing and maintenance of equipment where unexpected energization or start-up of equipment could harm employees.

In general, all power sources that *can* be locked out must be *locked out* for servicing or maintenance. Guards or interlock devices cannot be used as substitutes for locks.

POWER SOURCES THAT CANNOT BE LOCKED OUT

In very rare cases, a power source cannot be physically locked out. Discuss this situation with your supervisor to find out if *tagout alone* may safely be used. There are a few situations where tagout alone is allowed.

FOLLOW THE PLAN

The standard requires that employers develop written energy control programs that clearly and specifically explain all procedures for lockout/tagout. These plans must include:

- Lockout/tagout procedures.
- Employee training.
- Periodic inspections.

Employers must identify and differentiate between authorized and affected employees. **Authorized employees** physically lock or tag out equipment for servicing or maintenance. Note that these individuals are not necessarily the people who normally operate the equipment.

Affected employees are those workers whose job requires them to operate equipment subject to lockout/tagout, or those employees who work in areas where lockout/tagout is used. Affected employees stay clear of equipment while it is locked out.

CONTROLLING ENERGY SOURCES

A wide variety of energy sources require lockout/tagout to protect you from the release of hazardous energy. Some of these energy sources include:

- **Electrical**
- **Mechanical**
- **Pneumatic** (involving gases, especially air)
- **Hydraulic** (involving fluids)
- **Chemical**
- **Thermal**
- **Water under pressure** (or steam)
- **Gravity**
- **Potential**

Some of the problems of hazardous energy include:

- Accidental start-ups
- Electric shock
- Release of stored, residual, or potential energy

THE LOCKOUT/TAGOUT PROCEDURE

Lockout/tagout procedures cover the following:

- The scope and purpose of lockout/tagout.
- How to perform a shutdown, including isolating, blocking, and securing machines or equipment.
- How to place, remove, and transfer locks and who is responsible for them.
- How to test the machine to make sure it is locked out.

Preparing for a shutdown

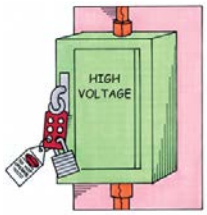
Before authorized employees turn off a machine as part of a lockout/tagout procedure, they must know:

- The type and magnitude of the energy involved.
- Associated hazards of the energy involved.
- Control methods for the energy involved.

Performing a shutdown

First, authorized employees shall notify all affected employees that they are about to start a lockout procedure. Then they locate all energy sources that power the piece of equipment. Some machines may have more than one source of power. Follow the procedures to shut down each machine.

Isolating equipment and applying lockout devices



Machines or equipment to be locked out should already be capable of being locked out. Every power source has its own procedure for lockout. Lockout may be accomplished by pulling a plug, opening a disconnect switch, closing a valve, bleeding a line, or placing a block in the equipment. Generally, authorized employees follow this sequence of events:

- After they have completed the shutdown, they turn off the energy at the main power source.
- Using their designated locks, they lock out all energy sources involved.
- They attempt to restart the machine to guarantee that the power is shut off, and then they return the control knob to the off position.

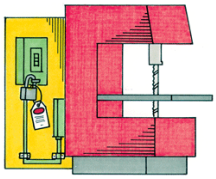
If several people are needed to work on a piece of equipment, each one must apply his or her locks. This prevents any accidental start-ups while another employee may still be working on the machinery. In this case, they'll use a **multiple lockout device** that can accommodate several locks at once.

Note: Authorized employees may never use another employee's lock and may never lend theirs.

Safe release of stored energy

Equipment must be at "zero energy state" before servicing or maintenance work can begin. To get to this zero energy state, authorized employees:

- Drain all valves, bleed off air from a system, eliminate stored hydraulic pressure, or use any method to release energy that is detailed in the lockout/tagout procedure.
- Test the machine to make sure that all energy was disconnected or released.



Verify that the machine is locked out

Before authorized employees start to repair or service the machine; they make sure that it has been properly isolated and deenergized. With locks in place, they try to start the machine to make sure it can't be turned on.

Restoring power

After servicing is finished, authorized employees check that all tools are removed from the area and replace all machine guards. They make sure all employees are clear of the machine. Only then can they remove the locks and reconnect all sources of energy. After this, they are to notify the affected employees that the lockout has been removed and the machine can be restarted.

TRAINING AND AUDIT REQUIREMENTS

- All **authorized employees** are trained in the recognition of applicable hazardous energy sources, the type and magnitude of hazardous energy sources in use at the facility, and how to perform the lockout/tagout procedures.
- All **affected employees** must be trained in the purpose and use of lockout/tagout.
- All other employees must be instructed on the purpose of the plan, but not in its actual use.
- Periodic inspections or audits must be performed by an authorized employee who does not use the energy control procedure being inspected.
- Retraining must be done when there are changes in equipment, job assignment, or procedures, when an audit shows deficiencies with the procedure, and when the employer feels the procedures should be reviewed.

Audits must be done at least annually, and should include questions to determine if employees understand the purpose of lockout/tagout, if proper locks and tags are being used, and if established procedures are being followed. Each audit must be documented.

OTHER CONCERNS

Other concerns that must be addressed for your organization's lockout/tagout program include working with outside contractors and shift and personnel changes.

Outside contractors
Outside contractors must be informed of your lockout/tagout procedure in full detail so that their employees understand the meaning of locks or tags that they may come across during the course of their work. In addition, if contractors will be using locks or tags, they should inform your employer so that everyone affected may be notified.

Shift and personnel changes
In general, if a piece of equipment is locked out at shift change, the person on the next shift must apply his lock before the employee who is leaving can remove his.

WORK AT WORKING SAFELY

Always follow lockout/tagout procedures during servicing or maintenance of equipment where unexpected energization or start-up of the equipment could harm you or a fellow employee.

1. Always lock and tag out power sources and switches when you service or repair energized equipment.
2. Never ignore or remove the locks or tags of other employees when you come across them in the workplace.
3. Know your role as an authorized or affected employee.