What is lockout/tagout?

Tagout law

The lockout/tagout standard is designed to protect employees involved in service and maintenance activities against the unexpected start-up of machines or equipment, or the release of stored energy that could cause injuries. The standard allows each employer to develop a program with procedures designed to meet the specific needs of the machines and equipment used by employees.

There are also other specific standards covering the special needs of agriculture, electric utilities and maritime employees (among others), not covered under the lockout/tagout standard.

Of the many Occupational Safety and Health Administrative (OSHA) standards, others also cover lockout/tagout procedures, so this one is designed to only supplement — not replace — those other standards. Specifically, standards like those for confined space and process-safety management require lockout/tagout procedures to be in place, but do not specifically spell out these procedures. In those cases, the employer may use the lockout/tagout standard to develop a complete energy control program (ECP).

The ECP is the heart of the standard. The requirements for energy control procedures are included in the ECP. Additionally, include performance requirements for both application of energy controls and procedures for release from lockout/tagout will be included.

Periodic inspection

Under the ECP, there are requirements for periodic inspection of the energy control procedures. These requirements ensure you can incorporate any changes or corrections of deficiencies into procedures that help promote health and safety.

Hazardous energy sources

The unexpected activation of machinery or process equipment during maintenance operations can have tragic consequences. Therefore, it is important that employees are aware of the various types of energy sources and the hazards associated with those energy sources.

Thermal energy

Thermal energy is more difficult to handle than other energy sources. Employees typically can't turn it off or eliminate it. However, they can control or dissipate it. For example, if you are inside of a walk-in refrigerator, you may turn it off, but it will remain cold until it dissipates.

In addition to thermal energy generated by machines, chemical reactions create thermal energy. Chemical reactions affecting temperature are called exothermic or endothermic. Exothermic reactions raise temperatures. Endothermic reactions lower temperatures.

You must write the methods of isolating and controlling the thermal effects of chemical energy specifically for those chemical processes unique to your work environment.

Mechanical energy

Mechanical motion, also called kinetic energy, is usually described as either transitional (linear) or rotational.

Transitional mechanical motion denotes movement from one stationary point to another, such as a conveyor belt or rollers.

Rotational motion means movement on things that go around, such as motors, drive belts, mixers, etc.

Electrical energy

Generated electric power is usually found at the main source of electricity to the equipment. You can sometimes find it in the circuitry within the machine or equipment. Static electricity is usually fixed on the surface of an object. You can find it in electrostatic precipitators that heavy industry commonly uses to control air pollution.

However, both general electrical power and static electricity can be dangerous, so the employer should be aware of the risks of both.

Potential energy

Just like thermal energy, you cannot turn off or on potential energy. You can only dissipate or controll it. Potential energy means pressure, springs or gravity. Pressure can be hydraulic, pneumatic or vacuum.

Hydraulic pressure takes advantage of the fact that you cannot compress liquids. When you apply force to contained liquid or hydraulic fluid, the liquid acts as a force, which it applies in all directions.

Pneumatic pressure is similar to hydraulic except that it uses air. Compression can be constant, like in a running compressor, or it can be compressed and stored in a vessel or tank. Any pneumatic tool, ram, press, etc. is driven by the forces generated by compressed air.

Vacuum pressure tends to resemble reverse pressure such as the pressure from a beverage can or a closed system. When certain systems use vacuum as a means of activation, and the machine is turned on, the machine can injure the employee.

Major messages

Make messages site specific but don't use words only. In certain instances, symbols also are appropriate, as long as they're consistent and convey the same warning as the written message.

In addition to all other requirements for lockout/tagout devices is the requirement that all devices contain major messages. You must make the messages appropriate to that particular device such as:

DO NOT START;
DO NOT OPEN;
DO NOT CLOSE;
DO NOT ENERGIZE;
DO NOT OPERATE.

Energy control program

The ECP consists of the energy control procedures, employee training on those procedures and periodic inspections relating to the procedures. And one of the most important elements of the program is whether to use lockout or tagout to control hazardous energy.

Lockout is preferred over tagout for the following reasons:

- Locks are very difficult to remove. Employees can easily remove tags;
- Tags generally serve as only a warning and are not considered a safety device. Locks are considered safety devices;
- You can easily lose tags. Chemicals or materials can also damage tags;
- Everyone understands the meaning of locks.

Whenever choosing tagout over lockout, it must provide employees the same level of safety that lockout procedures would. Under the standard, this level of safety is called "full employee protection."

Full employee protection means that if you select tagout over lockout, the employer must not only comply with the tagout-related provisions of the standard but must take the extra step to make sure that tagout is the best method.

When the employer decides whether lockout or tagout is the best method, employees must make sure the locks or tags are effective. The employer will provide equipment — chains, wedges, blocks, etc. — that will help determine whether energy sources are under control.

Performance requirements for lockout/tagout devices

- Employees must easily recognize each lockout/tagout device. It's imperative employees don't mistake the device for anything else.
- You must only use the device on the machine. If the employer puts more than one device on the machine, it may confuse employees.
- Do not use the lock for any other purpose. The lock loses its importance if it's been used for anything else.

- The lock must be durable, holding up to the environment, chemicals, temperature extremes or any other problem it may endure.
- The lock must be identifiable by everyone who'll have anything to do with it.

Testing during lockout

When testing essential equipment, you must follow certain procedures to ensure viability.

- Remove all nonessential equipment, tools and test instruments from the work area. Make sure any guards, safety restraints or other mechanical parts have been properly replaced.
- Make sure nonessential personnel are clear of the machine.
- Remove the lockout/tagout devices.
- Re-energize the equipment and proceed with tests.
- De-energize and re-apply the energy control measures in accordance with the written lockout/tagout procedures.

Outside contractors

When working with outside contractors, the key points are understanding and compromise. You must establish a workable medium between what's necessary at the job site and the contractor's specific procedures. Then, these must still fall under each other's ECP. Perform all of these procedures with an eye on lessening the potential for workplace injury.

Shift change

The shift change is one of the most potentially dangerous situations on a job site with lockout/tagout possibilities. Whenever one worker leaves a machine and doesn't remove his/her personal lock or tag, it opens everything up to speculation. Then, the person on the next shift may come in and do the wrong thing. There are ways to prevent some of these possible safety problems.

- Work permit — Lockout/tagout devices are not removed during shift or personnel changes. Instead, a work permit is re-issued after each shift or personnel change, allowing the oncoming authorized employee the opportunity to inspect the equipment.
- Operation locks — This procedure determines that the master lock is the first lock applied to the equipment after it's de-energized and the last to be removed. Each employee attaches his or her personal lockout/tagout device while working and removes it after the work has been completed.
- Temporary tagout — Outgoing employees remove their lock or tag before the next employee arrives. At the time the personal lock is removed, the outgoing employees should apply a tag. This tag will have space for the outgoing employee to sign his or her name, date and time. The next employee could then verify that the equipment was de-energized before applying his or her personal lock and removing the temporary lock.

Training

The OSHA standard concerning lockout/tagout reads, "OSHA considers these training requirements to be of critical importance in helping to ensure that the applicable provisions of the hazardous energy control procedures are known, understood, and strictly adhered to by employees."

You should train three groups of employees:

- Authorized employee — This is the employee who will physically perform the lockout/tagout and the servicing of the machine. Trained at least annually, this employee should be well-versed on all facets. This employee should know everything about ECP, including:
  - Hazardous energy recognition;
  - Type and magnitude of energy present;
  - Types and quantities of energy control devices;
  - Isolation;
  - Points of control;
  - Lockout/tagout devices;
  - Lockout procedures;
  - Re-energizing procedures.

- Affected employee — This is the employee who'll operate the equipment that's the authorized employee is servicing. This employee is trained initially and again if there's a change in job assignment or a change in equipment. Additionally, the affected employee must perform these duties:
  - Immediately recognize lockout/tagout devices;

- Know the purpose of lockout/tagout devices;
- Determine when a control procedure is in use;
- Know not to disturb lockout/tagout devices;
- Know the danger of violating procedures.

- Other employees — These employees receive training for different reasons. While they are taught the purpose of the ECP, they also are taught to never touch any locks, tags or equipment covered under the program. This training is done during new employee orientation, through the use of employee handbooks and through regularly scheduled safety meetings.

Lockout/tagout is a very important facet of the ECP. If executed correctly, it's an invaluable part of the program. However, it is only the first step. Employees must do all they can to make sure the program is safe and hazard free.

Group lockout

Any procedure for group lockout, under the ECP, must be as safe and effective as the personal lockout/tagout program. Group lockout situations are initiated when there's a job that requires several people.

Even on these projects that require multiple personnel, there still has to be one key person in charge. Some of the things the key person would do are:

- Verify shutdown and isolation of equipment prior to allowing a group member to apply his or her lockout/tagout device;
- Make sure all group members have completed their assignments, removed their lockout/tagout devices and are clear of the equipment before it's re-energized;
- Coordinate the safe transfer of lockout/tagout control between other work groups and shifts.

Also, lockout/tagout must be the first and last procedure performed each shift. Each authorized member of the group must apply his or her personal lockout/tagout device to the group device before beginning work and must remove those devices when work stops or the equipment is being serviced.