SeaBRIGHT INSURANCE COMPANY

Supervisors' Safety Update

Ideas and Strategies for Leaders

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LOCK OUT / TAG OUT
CONTROL OF HAZARDOUS ENERGY SOURCES

By SeaBright Insurance Loss Control

The federal government estimates that over 120 fatalities and 60,000 non-fatal injuries occur each year because of failure to follow appropriate lock out/tag out procedures. According to OSHA, the 3 million workers who service and maintain mechanical equipment face the greatest risk of being injured by unexpected movement of machinery or equipment while they are working on it. Typical injuries include amputations, fractures, lacerations, contusions, and puncture wounds. The average time loss associated with these injuries is 24 days per person.

Energy - Friend *and* Foe:

Two categories of energy are involved in this hazard—kinetic and potential. The motion of an object such as a saw blade, conveyer belt, or flywheel causes kinetic energy. Potential energy is power that is *stored* in a mechanism and can be unexpectedly released. Examples of potential energy are raised loads, coiled springs or compressed gases. A lock out/tag out pro-gram should consider both energy systems in terms of their potential for employee injury. Energy is our partner in work, but uncontrolled it can be deadly.

Energy Systems:

Electrical circuits are the primary energy source for many machines. Hydraulic systems operate by placing fluids under pressure. Pneumatic systems operate with air under pressure. Pressurized liquids and gases are energized in pipes, supply lines, storage tanks, and vessels. Gravity is potential energy from elevated objects. Springs contain potential energy that can provide power when they are compressed or under tension.

Energy Hazards:

Failure to shut down equipment, disconnect power sources, release residual energy and clear work areas of personnel prior to repairing or adjusting machinery are all recognized, critical hazards. Situations like these, as well as accidental equipment start ups, are common causes of severe injuries.

Accidents happen when someone turns off a switch to work on machinery—then another person turns it on, not knowing a co-worker is in danger. They also happen when someone shuts down equipment without realizing it may have stored energy that could be unexpectedly released. This is why OSHA implemented the Lockout/Tagout Standard 29 CFR 1910.147 for general industry in October of 1989. Firms that utilize hazardous energy systems for their production processes are required to comply with this standard.

OSHA's General Requirements:

- Develop specific procedures (generally in writing) for the control of hazardous energy, including preparation for shutdown, equipment isolation, lockout/tagout application, release of stored energy, verification of isolation, and restoring equipment to normal production operations.

- Use locks when equipment can be locked out, and ensures that new or overhauled equipment can accommodate locks.
- Implement an effective tagout program to ensure safety when tags rather than locks are to be used.
- Obtain standardized locks and tags that indicate the identity of the employees who use them and which are of sufficient quality and durability to ensure their effectiveness.
- Require that each lockout/tagout device be removed only by the employee who applied it.
- Train employees in the specific energy control procedures for their department. Include training reminders as part of an annual inspection of the control procedures.
- Adopt procedures to ensure safety when equipment must be tested during servicing, when outside contractors are working at the site, when a multiple lockout is needed for a crew servicing equipment, and when shifts or personnel change.

Excluded from Coverage:

- Normal production operations, including repetitive, routine, minor adjustments, which would be covered under OSHA's machine guarding standard, require no formal program.
- Work on cord and plug connected electric equipment when it is unplugged, and the employee working on the equipment has complete control over the plug are also excluded.
- Hot tap operations involving gas, steam, water, or petroleum products are generally exempt from the standard. But employers must show that continuity of service is essential, shutdown is impractical, and that documented procedures provide effective protection for employees.

Lockout or Tagout?

Whether you decide to use locks or tags, the purpose is to prevent hazardous energy from injuring or killing personnel. Each device has its own specific uses and procedures.

Lockout involves using a lock, either key or combination type, to hold a switch, circuit breaker, valve handle, or any other energy isolating device in the off position. This prevents the unplanned energizing of a machine or equipment. Included are blank flanges and bolted slip blinds. Using a lock is considered safer than using a tag.

Tagout is the placement of a written warning tag on the energy-isolating device while it is in the off or closed position. When tags are used, additional training is required to inform personnel about the limitations of tags and the importance of following their warnings. If tagout alone is used, an employer must be prepared to prove that a "tagout only" system provides the same level of protection that a lockout system provides. A company may require that both locks and tags be used.

Regardless of whether a lock, tag, or combined system is used, it is imperative that employees understand and follow the correct procedures that are specific to your organization. They must realize that more than one switch, valve or connection may control a piece of equipment and all of these must be deactivated during service or repair..

Who Must Receive Training?

All affected employees must be trained in the policy and procedures your company has developed for control of hazardous energy. Only authorized and trained employees can perform lockout/tagout procedures. Authorized employees must inform affected employees of lockout/tagout activities. Definitions of these terms* are as follows:

"Affected employee": An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

"Authorized employee": A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance.

One senior manager or designated person should review with each authorized employee his or her responsibilities under the program. If deficiencies are noted in terms of the employee's understanding, or if observed procedures during a sample run-through are incorrect, retraining should take place.

Retraining should also occur if job assignments have changed; processes, equipment, or hazards have been added or changed; or if there have been revisions to the lockout/tagout program.

** Additional definitions related to this standard will be found in 29CFR 1910.147.*

Preparation for Lockout / Tagout:

First make a survey to locate and identify all valves, switches, or other energy isolating devices that apply to the equipment which is to be locked or tagged out. More than one energy source (electrical, mechanical or others) may be involved in an operating system.

Sequence of Lockout/Tagout System Procedures:

1. Notify all affected employees that a lockout or tagout system is to be followed and the reason for this. The authorized employee must know the type and magnitude of energy that the machine or equipment uses and must understand the hazards involved.
2. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.). This will isolate the equipment.
3. Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, air, gas, steam or water pressure, etc.) must be dissipated or restrained by reliable methods such as repositioning, blocking, bleeding down, etc.
4. Lockout/tagout the energy isolating devices with an assigned individual lock(s) or tag(s).
5. After ensuring that no personnel are exposed, and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.

   CAUTION: Return operating control(s) to neutral or off position after the test.
6. The equipment is now locked out or tagged out.

Restoring Machines or Equipment to Normal Production Operations:

1. After the servicing and/or maintenance is complete and equipment is ready for normal production operations, check the area around the machine or equipment to ensure that no one is exposed to danger.
2. After all tools have been removed from the machine or equipment, guards have been reinstalled and employees are in the clear, remove all lockout/tagout devices. Operate the switch, valve, etc., to restart the machine or equipment.

More Than One Authorized Person:

In the preceding steps, if more than one individual is required to lockout/tagout equipment, each should place his/her own personal lock or tag on the energy isolating device(s). Typically, a labeled lockout hasp is used as a multiple lock or tag device.

These hasps are just one of a variety of specific lockout/tagout devices for electrical, hydraulic and pneumatic systems that are available from safety equipment suppliers.

Conclusion:

The control of hazardous energy sources for the prevention of workplace accidents is serious business. Employees need to be aware of the dangers associated with energy sources, and procedures must be in place to ensure their safety during the start up, repair, maintenance, and restoration of equipment or operational systems.

Your company's development of an energy control program, training of personnel, and full implementation of a lockout/tagout procedure is just one element of an effective safety program. As a supervisor, you play a critical role in making this program successful.

For more information, or for help with developing or improving your lockout/ tagout program, contact your SeaBright Insurance loss control consultant. ■