

# Lockout/Energy Control: Helping to Fill the Gaps

**M**any workplaces must comply with the lockout energy control (OSHA Subpart J 1910.147) standard because they have machines that personnel need to access to perform service and/or maintenance. Many of these companies have had lockout programs in place for many years. However, as a safety consultant that is called on to review and provide safety programs, procedures and training, I see many deficiencies as well as a consistent misunderstanding of what exactly is required to achieve an effective over-all lockout program.

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The basic elements that must be in place to achieve compliance with the lockout standard are:

- energy control procedures;
- protective materials and hardware;
- periodic inspections;
- training and communication.

## ENERGY CONTROL PROCEDURES

Machine-specific energy control procedures must be developed for just about every piece of equipment at a facility in which the unexpected energization or startup of the machines or equipment or release of stored energy could cause injury to employees while servicing and/or maintenance is performed, unless that machine or equipment meets the following criteria:

- cord and plug-connected equipment (handheld tools, computers, printers, etc.), provided exclusive control is maintained;
- other equipment when all of the following are true of a particular piece of equipment:
  - 1) the machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shutdown, which could endanger employees;
  - 2) the machine or equipment has a single energy source that can be readily identified and isolated;
  - 3) the isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
  - 4) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
  - 5) a single lockout device will achieve a locked-out condition;
  - 6) the lockout device is under the exclusive control of

the authorized employee performing the servicing or maintenance;

- 7) The servicing or maintenance does not create hazards for other employees; and
- 8) The employer, in using this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

These energy control procedures must be developed to include these fundamental areas:

- a specific statement of the procedure's intended use;
- specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
- specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and
- specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices and other energy control measures.

In my experience, the major elements missing from most lockout procedures are the transfer of lockout provision as well as good methodologies to properly verify the effectiveness of lockout and to verify that no residual energy (steam pressure remaining in lines, rotational energy, gravity, air pressure) still remains in the system. Information within the procedures must tell the maintenance person how to ensure that all energy has been released, removed, bled off, secured or otherwise rendered safe.

Additionally, many times when we review programs that are already in place or are called on to develop procedures for a client, the facilities equipment is forgotten. Rooftop units, air handlers, air compressors and similar equipment are also required to have procedure coverage under this standard.

Machine-specific lockout procedures are often not developed for single-energy-source pieces of equipment, but some single-source equipment has the potential to still have stored or residual energy that could harm someone. Under the eight criteria for lockout procedures, Item 1 states that if a potential exists for stored or residual energy after locking out the disconnect, then a lockout procedure is required.

A prime example of this would be an exhaust fan unit, which would have a local disconnect and therefore single-source, exclusive control but would still have the potential of the fan blades rotating long after the system

was shut off, which could cause an injury if the hazard was not properly identified. We were recently called out to review a company's program that had such an injury. On a rooftop exhaust fan unit for an oven, a maintenance worker shut off and locked out the electrical disconnect but forgot to wait for the fan unit inside to stop rotating before checking the tension on the belt. The individual stated that he quickly looked inside and the fan blades were rotating at such a speed that it looked like they were stopped.

Common lockout procedures can be developed for like equipment. In other words, if a facility had 30 exhaust fan units that were similar in design, function and isolation methodology (i.e., same disconnect types), then one procedure could be developed for all 30 of these units. This is important to consider when developing an effective lockout program, and it is of the utmost importance to ensure that this common lockout procedure idea is not misapplied. The equipment covered by a common lockout procedure needs to be similar in every way when it comes to how it is locked out.

#### PROTECTIVE MATERIALS & HARDWARE

Protective materials and hardware required would include items, such as the lockout locks in addition to the tags, chains, ball valve lockout covers, wheel valve lockout covers, breaker lockout devices or other hardware required for the isolation of the equipment from their hazardous energy sources. The employer must provide these devices.

Too often, companies purchase boxes of lockout hardware without looking at their facility to determine the proper size, quantity and types of lockout devices required. We recently helped a warehouse facility get their lockout program together, and one engineer took us to their storeroom so that we could see what lockout hardware they had on hand. We went through boxes of lockout hardware that had never been opened, and for the most part, they contained about 100 wheel valve covers for 14" wheel valves. This facility has numerous roller conveyors, wrappers, labelers, baggers and other equipment that is primarily fed by electrical and flexible tube 30 psi compressed air. The only valves at this facility that were this large were the valves for the sprinkler risers, and there were only ten of those.

We mainly work at much more complex manufacturing facilities that have different sizes and types of valves and energy-isolation devices for their equipment, and while providing centralized lockout stations is a good

start, it still requires personnel to go to these lockout stations and to find the correct lockout hardware that would be required for their specific machine. It would be a better practice to set up lockout hardware kits by machine types. By having these kits, the maintenance personnel could obtain a complete set of lockout hardware for the particular machine or system on which work is to be performed. Minimizing the guess work and making it as easy as possible for personnel to comply with the program must be the objective.

Additionally, companies that have proper lockout hardware onsite sometimes provide little or no training on how to properly use the lockout devices. Some lockout hardware devices can be cumbersome to use, especially certain ball valve lockout devices. If not properly put on, the valve handles on these lockout devices serve no more than as a potential head injury to people working underneath when they slide off the handle due to improper use. Proper training on how to use the lockout hardware must be part of the program.

#### PERIODIC INSPECTIONS

OSHA requires that:

- The employer shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are followed.
- These inspections shall be performed by an authorized employee other than the ones(s) using the energy control procedure inspected.
- The employer shall certify that periodic inspections have been performed.

The point of these periodic inspections is to find and correct any deviations or inadequacies identified. To do this, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure inspected. Ideally, a lockout inspection form should have a series of yes/no questions on it that the inspector could fill out and add comments. This would allow the safety committee, safety manager or other person(s) responsible for the lockout program to ensure that the training, lockout procedures and the overall program are updated and modified as needed to ensure that any problems identified are corrected.

These inspections are required to be performed at least annually for each procedure and for each authorized employee who is permitted to lock/tag equipment for servicing or maintenance. Companies should have a fairly routine methodology in place of inspecting the lockouts on a routine basis so there is no mad dash at the end of the year to complete all of the inspections. The intention of this requirement is to find problems in the

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**Editor's Note:** See the article in this issue titled "Lockout/Tagout & Machine Guarding: The Minor Servicing Exception" for a related discussion on the relationship between LOTO and machine guarding standards.



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program, procedures or person’s understanding of these items and to make the necessary corrections. Companies often look at this as a tattletale-type task and therefore if they do the inspections, the inspectors check all boxes as “yes” so they do not get their co-workers in trouble. When we are called upon to do a third-party audit, we find a completely different picture. We must strive to get the message across that this is not to find fault with a particular person(s), but to find deficiencies or opportunities for improvement within the overall program.

**TRAINING & COMMUNICATION**

Training is an essential part of any safety program. However, we often see that annual lockout training is required as part of a company’s lockout program. While I never discourage annual training, the problem we see is that it is a rehashing of the OSHA standard and does not meet the true nature of what is required.

The 1910.147 regulation does not contain an annual requirement for training. The annual requirement is for periodic inspections. The requirement for retraining is as follows:

- Retraining shall be provided for all authorized and affected employees whenever there is a change in job assignments, machines, equipment or processes that present a new hazard or when there is a change in energy control procedures.

- Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in the employee’s knowledge or use of the energy control procedures.

- The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

The training’s focus must be to look for the gaps, deficiencies and changes in the program, procedures or work practices and train to these items.

**ELECTRICAL LOCKOUT**

Another important item to consider as part of an effective lockout program is not contained within the 1910.147 regulation but within the Subpart S regulations. The Subpart S regulations contain specific training requirements for persons who are permitted to work near energized parts. These persons are known as qualified persons.

Many times when we talk to companies about their energized work safety requirements, they tell us that they work on everything deenergized and never open a panel door without first shutting off the power. In most cases, this is not reality; troubleshooting, voltage testing, taking amp draws, diagnostics on control boards and other tasks must be done, and the system must be energized.

Even if the company were to argue that it does not do these tasks, an electrical system is not considered “electrically safe” (meaning no electrical hazard is present) until it has been minimally shut off, locked out and verified to be deenergized (voltage test). Until all three of these items (up to and including the first voltage test to verify a deenergized condition) are completed, the system is to be treated as energized and therefore a qualified person (one who has received special training on electrical hazards) is the only person who can enter these areas and perform that work and only while wearing the proper arc flash and shock PPE.

If work is to be performed on the electrical circuits, a qualified person must be the one to perform the lockout for these tasks.

**CONCLUSION**

As safety consultants, it is important that we do our best to ensure that we do not let our clients fall into these common gaps that exist in many lockout programs. We need to make them aware of where deficiencies exist and of opportunities for improvement. ☺

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