



MICHIGAN ELECTRIC COOPERATIVE
ASSOCIATION

Lockout/Tagout

Being around energy is an everyday part of our lives, and an important part of our workplace operations. High pressure steam, electricity, hydraulic and pneumatic systems, even the force of gravity are common forms of energy used to power our machines and processes. While energy is obviously useful, it can also be dangerous. Understanding how to properly control hazardous energy is one of the keys to workplace safety. The procedures used to control this energy, is commonly known as lockout/tagout.

TYPES OF ENERGY SOURCES

- In order to control energy correctly, we must first understand the types of energy sources we may find in the workplace.
- There are several types of energy sources, including electrical, mechanical, chemical, thermal and the force of gravity. No matter its source, the various types of energy must be harnessed and controlled in order to perform useful work.
- The types of energy can be divided into two states. When an energy source is in the process of actively doing its work, it is referred to as kinetic energy.
- Energy that is inactive but has the potential to do work is referred to as Stored Energy, or Potential Energy.

THE ENERGY CONTROL PLAN

- To help prevent injuries from the unexpected energization of machines or equipment or the unexpected release of stored energy, your organization has developed an “Energy Control Program” as outlined in OSHA standard 1910.147 titled “The Control of Hazardous Energy.”
- The energy control procedures contained in the energy control plan are commonly called lockout/tagout procedures because these procedures require an energy source to be isolated, locked and then marked with a tag to indicate it should not be operated.
- Usually, employees are protected from hazardous energy sources by things such as machine guards and cover plates; however, when these safety devices are removed or bypassed in the course of maintenance or repair operations, the energy sources must be controlled.

AUTHORIZED, AFFECTED AND OTHER EMPLOYEES

- When it comes to lockout/tagout operations employees are designated as either authorized employees, affected employees or other employees. Each designation carries differing roles and responsibilities.



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- Authorized employees play the key role in lockout/tagout; they must know the type and magnitude of the energy sources and understand the methods and means of isolating and controlling that energy.
- Affected employees are those who operate machines or equipment that will be affected by lockout/tagout operations.
- Affected employees must be notified before lockout/tagout operations are begun and informed which machines or equipment will be shut down and locked out.
- All other employees who work in the area of the lock-out must be able to recognize when a lock-out procedure is in progress. They shall be instructed about the procedure taking place and understand that they are prohibited from removing the lock or tag or attempting to apply power to locked and tagged equipment.

LOCKOUT/TAGOUT DEVICES

- Any time a lockout/tagout procedure is performed, some type of lockout device is needed. These devices come in a wide variety of types and styles.
- All lockout devices must be approved by the company. Within each organization, the approved lockout device will be consistent in color, shape or size so that they are easily identified.
- It must be substantial enough that it cannot be easily removed without excessive force, such as with bolt cutters. Lockout and tagout devices need to be able to withstand the environment to which they are exposed for the duration of the lockout.
- Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Attachment devices are required to be of a non-reusable type, attachable by hand and self-locking.
- They must be able to withstand 50 pounds of force. The print and format of the tag will be standardized to be recognizable.
- Once the company has approved a certain type of lock, tag or other device, it must not be used for any other purpose. Using lockout or tagout devices for other uses may cause confusion and reduce their effectiveness as a safety device.

ENERGY CONTROL PROCEDURES

- When preparing to lockout a machine, the authorized employee must be familiar with the written energy control procedures for the equipment. They must know its operation, the various types of energy it uses and how each energy source, including any stored energy, should be isolated.
- After identifying the energy types used and before shutting down the machine, notify all affected employees that the equipment is being removed from service. Explain why it is being locked out and remind them not to apply power to the equipment while it is locked and tagged.



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- After informing any affected workers, shut down the equipment using its normal control function.
- Once the machine is shut down, all energy sources should be locked in the off position using company approved lockout devices.
- After lockout and tagout devices are applied, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained and otherwise rendered safe.
- After a lockout procedure has been applied, it must be tested. Before servicing the equipment, attempt to operate the normal on/off controls to verify no power is connected to the machine.
- With some equipment there may be multiple locations from which to operate the machine. Attempt to operate the equipment from each location to verify the success of the lockout. If you have any questions about the proper method to lock out a piece of equipment or how to test to ensure the lock/out is complete, consult the written lock-out procedure.
- Once the repair work has been completed, it's time to begin returning the equipment to service.
- Replace all machine guards, safety devices and interlock switches.
- Locks and tags should be removed by the authorized employee who installed them.
- Notify all affected employees that the machine is about to be re-energized.
- Double-check that the control switches are still in the off position before reapplying power.
- After the machine's operation has been restored, verify that the repair work was successful before alerting affected employees that the machine is up and running.

SPECIAL SITUATIONS

- There are certain lockout situations which require special consideration. The three most common are group lockout, during shift changes and when outside contractors are working at a plant.
- During a group lockout, primary responsibility for the lockout will be given to a designated authorized person, who will be able to ascertain the exposure status of the individual members under him.
- Each employee is responsible for removing his or her lock and tag when they stop working on the machinery or piece of equipment. This ensures that all personnel are accounted for and out of danger before the machine is re-energized.
- Another special situation occurs during a shift change. Specific procedures should be listed in the written energy control plan for this situation in order to maintain continuity of a lockout; in this case, the departing workers must not remove their locks until the arriving workers attach theirs.
- An additional special situation is when working with outside contractors on-site. • In most cases, the on-site employer and outside employer will exchange copies of their respective energy control plans.
- A pre-job briefing with all those involved will take place and at times, an authorized on-site employee escort can provide additional training on the procedures for a specific task.
- When locking out equipment that is out of sight of its control panel, a coworker must help when testing the effectiveness of the lockout.



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- Finally, if you are unsure how to perform a proper lockout under certain conditions or on a particular piece of equipment, don't do it. Check the written plan or consult your supervisor.