



## OSHA'S LOCKOUT/TAGOUT RULE

### SUMMARY

New federal requirements under the Occupational Safety and Health Administration (OSHA) place added demands upon employers to protect workers from sources of electrical, mechanical, hydraulic, and other energy hazards. The rules apply while setting-up, servicing, or maintaining machinery of virtually any type. Except for machines that can be completely deactivated by simply unplugging the power source, employers must: 1) establish a system of tags and lockout devices; and, 2) train employees in the use of the system.

Employers are also held responsible for: 1) maintaining records of employee training on this subject; and, 2) conducting an annual review of the system to assure that it is adequate.

Provisions must also be made to assure that "outside" employees (riggers, service contractors, etc.) are subject to a lockout/tagout procedure while in your plant.

### SCOPE

The regulations cover situations where employees face potential hazards from the unexpected start-up or energization of equipment that is being serviced, maintained, or set-up. Try-out operations for special machines or other special tooling are also covered by the regulations.

Service and/or maintenance which takes place during normal production operations is covered only if:

- an employee must remove or bypass a guard or safety device; OR,
- the employee must place any part of his or her body into the machine's point of operation, or a related hazard area.

"Point of operation" refers to any area where work is actually performed, such as:

- a. Between the cutting tool and workpiece;
- b. Between the electrode and the workpiece on an EDM;
- c. Under the ram of a stamping press, or inside the die area;
- d. Inside a mold cavity, or in the closure area of a molding press; or,
- e. The unguarded surface of a grinding wheel.

Minor tool changes, adjustments, and other minor servicing activities that take place during the "production" cycle must be routine, repetitive, and necessary to the use of the machine in order to be exempt from these requirements. Such operations are still subject to any other applicable regulations for machine safeguarding and related safety standards.

The lockout/tagout regulations do not apply to equipment that can be completely de-energized by simply unplugging the power cord. In this case, however, the employee servicing the machine must be in full control of the plug.

### EMPLOYER REQUIREMENTS

Employers are required to set up a program of procedures and employee training to ensure employee protection from release of energy when maintaining, servicing, and setting-up equipment. Tryout of special machines or special tooling is also subject to the regulations and would generally be considered as a set-up situation. Potentially hazardous energy categories include electrical, mechanical, hydraulic and pneumatic, and most other energy sources.

The regulations require machine energy sources to be isolated and "rendered inoperative" during service, set-up, and maintenance. If the equipment is capable of being locked out, a lockout device is the preferred method. An example would be a main power switchbox with a hasp, locked into the "off" position by a padlock or combination lock. A

warning tag may substitute for a lock on lockout-capable machines only if the employer can demonstrate that the warning tag provides full employee protection equivalent to using a lock.

If tags are used in place of locking devices:

1. The tags must be attached at the same point where a lockout device would be placed; and,
2. The employer must meet all requirements for tagout, as described below; and,
3. Use additional safety measures, as necessary, to provide equivalence to the protection of a lockout.

Such additional steps can include removal of circuit elements, removal or blocking of handles or switches, etc.

### **Energy Control Procedures**

Employers are required to establish procedures for energy control during service, maintenance, and set-up. The procedures must be written, and the employer must enforce their use.

Having procedures in writing is not required only when all of the following conditions exist:

1. The machine has no potential for stored or residual energy, nor for reaccumulation of energy once the system is shut down (such as a simple mill, lathe, or grinder); and,
2. The machine has a single energy source that can be readily identified and isolated; and,
3. Isolation and lockout of the energy source will completely deactivate the machine; and,
4. The energy source is locked out; and,
5. A simple lockout device will achieve a locked-out condition; and,
6. The lockout device is under exclusive control of the authorized employee performing the maintenance, service, set-up, etc.; and,
7. The servicing, etc., does not create hazards for other employees; and,
8. That no accidents have occurred while using this exception.

### **Requirements for Written Procedures**

The written procedures within your company's energy control program (when required) must include:

1. A statement of the intended use of the procedure; and,
2. Step-by-step instructions for shutting down, and, isolating, blocking, and/or securing equipment; and,
3. Step-by-step instructions for placement, transfer, and removal of lockout and tagout devices, and, responsibility for the lockout/tagout devices; and,
4. Specific procedures for testing to verify that the lockout/tagout procedures and devices are effective.

## **LOCKOUT/TAGOUT DEVICES**

### **Requirements for Lockout/Tagout Devices**

A lockout device is defined as: "a device that uses a positive means, such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment."

A tagout device is defined as: "a prominent warning device, such as a tag and a means of attachment which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed."

1. Lockout/tagout devices must be provided by the employer.
2. Lockout/tagout devices must be uniquely identified within your plant. They must be the only devices used for energy control, and must not be used for any other purpose than energy control.
3. Lockout and tagout devices must be durable enough to withstand their environment, at least for the length of time they are expected to be in use.
4. Tagout devices must be constructed and printed so that exposure in wet locations will not cause the tag to deteriorate, nor make the printing illegible. Tagout devices must be resistant to corrosive environments if used in such conditions.
5. Lockout and tagout devices must be standardized within your plant according to color, or shape, or size. Format and printing of tagout devices must be standardized throughout your plant.
6. Lockout devices must be strong enough to prevent removal without "excessive" force (as with bolt cutters).
7. Lockout device attachments must be non-reuseable, attachable by hand, self-locking, and must have a minimum release strength to resist at least 50 pounds of force. The attachment portion must be at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.
8. Lockout devices and tagout devices must indicate the identity of the employee applying the devices. A tagout tag securely attached to the shackle of a lock will meet this requirement for lockout devices.
9. Tagout devices must bear a prominent warning statement such as:

- DO NOT START;
- DO NOT OPEN;
- DO NOT CLOSE;
- DO NOT ENERGIZE; or
- DO NOT OPERATE, etc.

Employee Responsibilities and Training - The burden of compliance with OSHA rests solely with the employer. However, employers are required to enforce certain responsibilities among employees under the lockout/tagout rules.

The regulations define AFFECTED EMPLOYEES as those whose jobs require using equipment being serviced or main-

tained under lockout or tagout, or who are required to work in an area where servicing and maintenance are being performed.

AUTHORIZED EMPLOYEES are defined as those who perform the lockout or tagout procedures. A worker who performs the lockout or tagout procedure, and then works on the locked-out or tagged-out machine is both an authorized employee and an affected employee. In most job shops, this would be the usual situation.

## REQUIREMENTS FOR TRAINING

The employer is responsible for providing training to ensure that workers know and understand the function and purpose of the lockout/tagout system, and that the workers have the necessary knowledge and skills to follow the system safely.

Each AUTHORIZED employee must receive training in:

- Recognition of hazardous energy sources;
- The types and magnitude of energy sources in the workplace; and,
- The methods and means of controlling and isolating such hazards.

Each AFFECTED employee must receive training in the purpose and use of the energy control procedure.

Any other employees whose work may bring them into an area where lockout/tagout procedures are being used shall be instructed about the procedures and shall be instructed not to start or energize equipment under lockout or tagout.

## SPECIAL REQUIREMENTS FOR TAGOUT TRAINING

When tagout systems are used, employees must be specifically instructed in the following limitations of tags (versus locks):

- Tags are warning devices that do not provide the physical restraint of locks;
- Tagouts are to be removed only by, or with the permission of, the authorized employee responsible for the tagout;
- Tagouts are never to be bypassed, ignored, or otherwise defeated;
- Tags must be readable and understandable by all authorized, affected, and other employees who may be in the area;
- Tags and their means of attachment must be durable for their environment;
- Tags may provide a false sense of security, and must be understood as part of the overall safety systems;
- Tags must be securely attached to avoid accidental removal.

RETRAINING must be provided whenever new hazards are presented by:

- A change in job assignments,
- Equipment changes, or,
- Changes in processes or in the lockout/tagout procedures.

Retraining is also required if the employer has reason to believe that the employees' knowledge and skills in these procedures are deficient. Retraining may also be required to correct deficiencies found in the lockout/tagout system itself. Retraining must reestablish worker proficiency, and must introduce new or revised procedures, as necessary.

## CERTIFICATION

Employers must certify that training has been accomplished and is up-to-date. Certifications must include the names of the employees trained, and the dates of training. A simple form can meet this requirement, and can also show the type of training provided (It is important that employees sign, stating that they have received the training.

## REQUIREMENTS FOR PROCEDURES

1. Energy isolations by lockout or tagout methods must be performed only by authorized employees.
2. NOTIFICATION: the employer or the authorized employee must notify affected employees:
  - a. Before the lockout or tagout is to be applied,
  - b. After the lockout or tagout is applied,
  - c. Before the lockout or tagout is removed, and
  - d. After the lockout or tagout is removed.
3. The lockout/tagout procedure must include the following elements, in sequence:
  - a. Preparation for shutdown: Before turning off a machine, the authorized employee must have knowledge of:
    - i. The type and magnitude of energy to be isolated or controlled,
    - ii. The hazards of the energy to be controlled, and,
    - iii. The method or means of controlling the energy.

*(Note: The employer is responsible for training the authorized employee on these points.)*
  - b. Shutdown: The equipment is to be shut down according to the procedures established. The shutdown must be conducted in an orderly fashion to avoid any hazards that may be involved in shutting the machine down.
  - c. Energy isolating devices (such as switches, die blocks, wedges, etc.) must be located and operated in a manner that will isolate the machine (or machine component) from the energy source.
  - d. Lockout/tagout devices must be attached to energy isolating devices by authorized employees.
  - e. Lockout devices (when used) must hold the energy isolating device in a "safe" or "off" position.
  - f. Tagout devices (when used) must be attached in such a way as to indicate that moving the energy isolating device from the "safe" or "off" position is prohibited.

- g. When tagouts are used on equipment capable of accepting a lockout device, the tagout must be securely attached at the same point where a lockout would be used (example: at an electrical switch with a hasp).
- h. When a tag cannot be attached directly to an energy isolating device, the tag must be located as close as safely possible to the energy isolating device, and must be “immediately obvious” to anyone attempting to operate the equipment.
- i. Stored energy: After application of the lockout or tagout device, all potential hazards from stored or residual energy must be relieved, disconnected, blocked or restrained, and otherwise made safe. Examples would be blocking the ram of a press (or placing it at its lowest point in its stroke); or bleeding hydraulic cylinders; or discharging capacitors in electrical machining systems.
- j. Verification: Before working on equipment that has been locked or tagged out, the authorized employee must verify that energy hazards have been isolated and de-energized.

If the possibility of reaccumulation of hazardous stored or residual energy exists, verification of energy isolation must continue through the service or maintenance work, or until the hazard no longer exists.

### **Release from Lockout or Tagout**

Before lockouts or tagouts are removed, the authorized employee(s) must ensure that:

1. **Machine & Equipment:** The machine must be clear of hand tools, loose clamps, and other non-essential items, and the machine must be in a condition to permit safe energization. Visual inspection by the authorized employee will meet this requirement.
2. **Employees:** All employees must be safely positioned or removed from the work area. Affected employees must be notified before lockouts and tagouts are removed and before the machine is energized.
3. **Removal:** Lockout and tagout devices are to be removed by the same authorized employee that applied the device. If the authorized employee who applied the tagout or lockout is not available, the device may be removed by another authorized employee, AS LONG AS THE EMPLOYER CAN DEMONSTRATE:
  - a. That removal by another authorized employee is governed by procedures that provide equivalent safety;
  - b. That the procedures are written;
  - c. That specific training is provided in these procedures;
  - d. That the procedures cover verification that the authorized employee who applied the device is not at the plant;
  - e. That the procedures include making “all reasonable efforts” to inform the absent authorized employee that the devices have been removed; and,

- f. That the procedures include a way of ensuring that the authorized employee knows that the lockout or tagout device has been removed before resuming work.

## **ADDITIONAL REQUIREMENTS**

### **Testing or Positioning Machine Components**

When lockouts or tagouts must be temporarily removed to permit tooling or positioning machine components, the following requirements apply:

1. Clear the machine of loose tools and accessories;
2. Notify and clear employees from the area;
3. Remove the lockout/tagout device and notify affected employees;
4. Energize the machine, proceed with testing, positioning, etc.;
5. Notify affected employees, de-energize, re-apply lockout/tagout, proceed with service, maintenance, set-up, or try-out.

Essentially, these are the same rules that apply to any situation involving application and removal of lockout/tagout devices.

### **Outside Personnel**

When service contractors or other “outside” personnel are involved in set-up, service, maintenance, or tryout activities, both the on-site employer and the outside employer are required to inform each other of their lockout/tagout procedures. You must ensure that your employees understand and comply with the outside employer’s lockout/tagout restrictions and prohibitions.

### **Group Lockout/Tagout**

When service, maintenance, set-up or try-out is performed by any group of employees, the procedures must provide equivalent protection to a personal lockout/tagout device.

All requirements for applying and removing lockout/tagout devices apply to group situations, plus the following additional requirements:

1. Primary responsibility for the group lockout/tagout must rest with a single authorized employee.
2. The authorized employee must determine the risk of hazard exposure to each member of the group.
3. When more than one group of employees is involved, a single authorized employee must be assigned responsibility to coordinate lockout/tagout among the groups to ensure continued safety.
4. Each authorized employee must apply a personal lockout/tagout device to the group lockout/tagout device when beginning work and remove the devices when ending service, maintenance, set-up, or try-out work on the machine.

## Shift or Personnel Changes

Written procedures must be used to ensure continuous safety and orderly transfer of lockout/tagout responsibilities between off-going and on-coming employees.

### SAMPLE LOCKOUT/TAGOUT PROCEDURE FOR MACHINE-TOOL SET-UP, TRY-OUT OR MAINTENANCE

1. Inspect and clear the work area of people, workpieces, loose tools, etc.
  2. Isolate and de-energize all potentially-hazardous energy sources on the machine system including:
    - a. Main power supply.
    - b. Secondary power sources as appropriate: toolchanger drives, lighting circuits, power feeds, Attachments & accessories, material handling devices, etc.
    - c. If the machine can be completely de-energized by unplugging, the person responsible for the set-up or maintenance work on the machine shall be solely in control of the plug. When this is the case, the remainder of these procedures do not apply.
- (NOTE: Use a checklist for each individual machine)*
3. Use a lock or tag (supplied by the company) to positively keep energy control switches and devices in the “safe” position.
    - a. If using a tag, complete the information on the blank spaces.
  4. If maintenance or set-up work is being performed by only one person, that person is to have control of the keys or combination to the lock(s), or of the use of tags.
    - a. If more than one person is performing the set-up or maintenance work, the most senior employee among

the group (supervisor, team leader, lead person, etc.) shall have control of lockout/tagout devices and is responsible for assuring that other team members follow safe practices.

5. After energy sources are locked out and/or tagged out:
  - a. Make sure workers and loose tools, workpieces, etc. are clear; and,
  - b. Attempt to energize the equipment to assure that the lockout/tagout is complete and effective; and,
  - c. If system is still energized, repeat steps 1-5 until systems are rendered safe through lockout/tagout.
6. Perform maintenance or set-up work as required.
7. When power is necessary during the set-up or maintenance to jog or position a machine component, or to advance a toolchanger, the responsible individual shall:
  - a. Remove lockout/tagout devices as necessary,
  - b. Inspect the system to assure that workers, tools, and materials are clear of hazard areas, and
  - c. Energize the system and proceed as necessary. If additional set-up or maintenance work is required after jogging or positioning machine components, lockout/tagout devices are to be reapplied until the set-up or maintenance work is completed.
8. Upon completion, the responsible person shall inspect to assure that hazard areas are clear of employees, unnecessary tools, and materials, and then remove lockout/tagout devices.

NTMA has prepared a video training program on this subject. For more information, or to order your copy, call the Publications Desk at 1-800-832-7753 or 301-248-6200.

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