



SAFETY & HEALTH NEWS

S&H #192

REPRINT: July 10, 2009
(originally published 1/12/90)

LOCKOUT - TAGOUT RULES NEW OSHA REGULATION

The Occupational Safety & Health Administration has issued a new safety standard requiring controls on hazardous energy to disable machinery and prevent the release of potentially hazardous energy while maintenance and servicing activities are being performed.

The new Standard, called Control of Hazardous Energy Sources (Lockout/Tagout), became effective on January 2, 1990. All companies, regardless of size, are required to comply with this Standard, although it is not yet clear what procedures and criteria OSHA will adopt to inspect under this Standard.

This new regulation is one of the most confusing ever drafted by OSHA, as you'll see later in this explanatory bulletin, and is currently the subject of several lawsuits. While efforts are being made to modify, amend or otherwise gain some degree of flexibility in its application, the fact of the matter is that the Standard is now in effect and screw machine products manufacturers must make an attempt to comply.

This bulletin attempts to acquaint you with the requirements of the Standard as promulgated and provide you with general compliance information. As more information becomes available, and as results come from the lawsuits mentioned above, PMPA will follow-up with a more detailed bulletin. Questions on compliance with this new OSHA Standard should be directed to Miles Free at PMPA headquarters.

SUMMARY OF THE STANDARD

The Lockout/Tagout Standard addresses practices and procedures required to prevent the release of potentially hazardous energy while maintenance and servicing activities are being performed on machines or equipment. The Standard requires that lockout be utilized for machines which are designed with a lockout capability, except when the employer can demonstrate that utilization of tagout provides full employee protection. For machines which were not designed to be locked out, the employer may use tagout.

After January 2, 1990, whenever major replacement, repair, renovation, or modification of machines is performed, and whenever new machines are installed, energy isolating devices for those machines shall be designed to accept a lockout device.

Each employer is required to establish an energy control program, consisting of a **written energy control procedure, employee training and periodic inspection**. The company's energy control program must utilize either lockout or tagout devices. If an energy isolating device (e.g. manually operated electrical circuit breaker, disconnect switch, line valve, block, etc.) is capable of being locked out, the program shall utilize lockout, unless the employer can demonstrate that a tagout system will provide full employee protection. Note that the term "energy isolating device" does not include a push-button or selector switch.

If an energy isolating device is not capable of being locked out, the program shall utilize a tagout system.

Energy Control Procedure

A written energy control procedure must be developed and utilized for the control of potentially hazardous energy when employees are engaged in activities covered by this standard. The procedure should outline the scope, purpose, rules, and techniques to be utilized for the control of hazardous energy. The procedure must include the following:

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

The lockout/tagout procedure described below is based on the most common screw machine products company situation where a single employee will be involved with lockout/tagout. Other requirements apply to a group of employees involved in covered servicing or maintenance activities. In such cases, each employee must have a personal device and each

must affix their device to and remove it from a group lockout device, group lockbox or comparable mechanism.

Specific procedures are also required to provide protection during shift changes. At a minimum, the procedure must include provisions to ensure the continuity of lockout or tagout protection.

The established procedure for applying a lockout or tagout control must include the following elements and must be done in this sequence.

(1) Preparation for shutdown

Before an authorized or affected employee turns off a machine, the authorized employee must have knowledge of the type and magnitude of the energy involved, the hazards of the energy to be controlled, and the method to control the energy. This information is part of the training requirement of the Standard (*see section on Employee Training*).

(2) Machine shutdown

The machine is turned off or shut down by using the normal stopping procedure.

(3) Isolate machine from the energy source

Once the push-button control, for example, has been used to stop the machine, isolation can be accomplished by tracing the path from the control toward the energy source and moving the energy isolating device control lever to the "off", "safe" or "open" position.

(4) Apply lockout or tagout to energy isolating device

Appropriate and effective lockout or tagout devices are then affixed to each energy isolating device by the authorized employee. If tagout is to be used, the tag must be fastened at the same point a lock would have been attached, or as close as possible and in a position that will be immediately obvious to anyone attempting to operate the machine.

(5) Release of stored energy

After application of the lockout or tagout device, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, or otherwise rendered safe. Compliance with this provision might require, for example, the use of blocks or other physical restraints to immobilize the machine or components, grounding to discharge energy, or bleeding to relieve pressure in hydraulic or pneumatic systems.

(6) Verification of energy isolation

This step in the procedure requires the authorized employee to verify that the preceding steps have been taken and may involve a deliberate attempt to start up the machine. Visual inspection of the position and presence of switches, valves, breakers, main power disconnects, and locks/tags should also be used to determine that all motion has been stopped and all components have come to rest.

At this point, required servicing and maintenance work may safely be performed.

(7) Removal of lockout/tagout devices

To release the machine from lockout/tagout, the following steps must be taken:

- a. Inspect the work area, remove tools and ensure that the machine is operationally intact.
- b. Notify affected employees that lockout/tagout devices are to be removed.
- c. Removal of each lockout/tagout device *by the employee who originally applied the device.*

Special Procedures

In situations where lockout/tagout devices must be temporarily removed from the energy isolating device and the machine energized to test or position tools, the following sequence of actions is to be followed by the person doing the servicing:

- (1) Clear machine of tools and other materials.
- (2) Alert and remove employees from the machine area.
- (3) Remove lockout/tagout device.
- (4) Energize and proceed with testing or positioning.
- (5) Deenergize all systems and reapply lockout/tagout device.

Employee Training

The employer must provide employee training to ensure that the purposes and function of the energy control program are understood by employees. There are two classes of employees which must be trained.

Authorized Employees are workers who lockout or implement a tagout system procedure on machines or equipment to perform servicing or maintenance.

Affected Employees are workers whose job requires them to operate or use a machine on which servicing or maintenance is being performed under lockout or tagout, or whose job requires them to work in an area in which servicing or maintenance is being performed.

Training must include the following:

- Each **authorized** employee must be trained to recognize applicable hazardous energy sources, the type and magnitude of energy in the workplace, and methods and means necessary for energy isolation and control.

- Each **affected** employee must be trained in the purpose and use of the energy control procedure and prohibitions on attempts to restart or reenergize machines which are locked out or tagged out.

When tagout systems are used, employees must also be trained in the limitations of tags. Those limitations include the fact that tags are warning devices only and do not provide physical restraint; when a tag is attached to an energy isolating device, it is not to be removed without authorization of the person who installed the device and is not to be bypassed, ignored or otherwise defeated.

The employer must certify that employee training has been provided by keeping a log which includes each employee's name and the date that training was provided.

Retraining is required 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 the energy control procedures. Retraining is also required whenever inspections reveal deviations from or inadequacies in the employee's knowledge or use of the energy control procedures (*see section on Periodic Inspections*).

Periodic Inspections

Periodic inspections of the use of the energy control procedure in the workplace are required at least annually. These inspections must be performed by an authorized employee, but **not** the one using the procedure being inspected. The purpose of the inspection is to identify and correct any deviations or inadequacies in the procedure. Included in the inspection is a review between the inspector and authorized and/or affected employees of the employee's responsibilities under the procedure. All inspections must be certified by the employer through a log identifying machines being inspected, date of inspection and the name of the inspector.

OPERATIONS COVERED BY THIS STANDARD

The Standard covers the servicing and maintenance of machines in which the *unexpected* energization or start up of the machine, or release of stored energy could cause injury to employees.

The Standard does not apply to cord and plug connected equipment if the equipment is unplugged and the plug is in the exclusive control of the employee who is performing the servicing or maintenance of that equipment.

OSHA defines "Servicing and Maintenance" to include activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. Excluded from coverage under the Standard are minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, **if** they are routine, repetitive and integral to the use of the equipment for

production, **provided** that the work is performed without the removal or bypassing of machine guards already required under OSHA.

Some common screw machine products manufacturing activities which fall under the definition of "servicing and/or maintenance", such as adjusting coolant lines, clearing chips, unjamming, making minor tool adjustments, and simple tool changes, are typically performed during normal production operations with the machine energized. Two criteria are used to determine whether such servicing activities are covered by this Standard or whether they are exempt from Lockout/Tagout under the exclusion mentioned above.

First, must employees bypass guards or otherwise expose themselves to potential injury? If no such exposure will occur, either because of the method in which the work is performed or because special tools, techniques or other protection is provided, then lockout/tagout is not required. For example, during set-up the machine is energized, as it must be, and all required safeguarding methods are properly configured and operational (door interlock, two-hand controls, etc.). Since safeguarding methods are **not** by-passed and there is no exposure to potential injury, lockout/tagout would not apply.

The second criteria is whether the activity is routine, repetitive and must be performed as part of the production process. For example, when an operator must make a minor tool change, he/she would stop all machine motion (e.g. disengage the clutch), change the tool, then restart the machine. Lockout/tagout could not be performed because the lockout procedure would prevent the machine from economically being used in production.

Therefore, normal production operations and minor servicing activities which meet these two criteria are excluded from coverage under this Standard, so long as the general machine guarding requirements are complied with.

OSHA recognizes that there are some servicing and/or maintenance activities which require the machine to be energized, at least at some point during the servicing but which do not meet the criteria for exclusion discussed above. For example, a set-up man is setting or changing tools where the machine guards have been by-passed, removed or in any other way disabled. In these types of situations, the Standard requires that where energization is needed only part of the time, and cannot be shown to be necessary for the entire servicing operation, lockout/tagout will apply and special procedures for the temporary removal of lockout/tagout devices are required. (*See Section on Special Procedures*)

Obviously, when machines or equipment are undergoing major repairs or are being rebuilt, the company's lockout/tagout procedures must be used.

The "rule of thumb" when trying to determine which activities are covered under this Standard could be stated as follows:

During any servicing or maintenance activities, **either** lockout/tagout or Subpart O, machine guarding, **must be complied with**. Whenever machine guarding must be by-passed to accomplish the required servicing or maintenance,

LOCKS AND TAGS

The Standard is fairly specific in describing the types of protective materials and hardware required under this Standard.

All locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware must be provided by the employer. Lockout devices and tagout devices must be singularly identified, the only devices used for controlling hazardous energy, shall not be used for any other purpose, and must be durable, standardized, substantial, and identifiable.

Durable: Lockout/Tagout devices must be capable of withstanding the environment to which they are exposed. Standardized: These devices must be standardized within the plant either by color, shape or size. Additionally, for tagout devices, print and format must be standardized. Substantial: Lockout devices must be substantial enough to prevent removal without the use of excessive force or metal cutting tools. Tagout devices, including their means of attachment, shall be of a non-reusable type, attachable by hand, self-locking and non-releasable with a minimum unlocking strength of no less than fifty pounds. OSHA states that tagout devices should be equivalent to a "one-piece all-environment-tolerant nylon cable tie". Identifiable: All devices must identify the person applying the device.

Tagout devices must warn against hazardous conditions if the machine is energized by use of wording such as "Do not start," "Do not open," "Do not close," "Do not energize," and "Do not operate." The use of graphics, pictographs or other symbols to convey the message is acceptable.

SAMPLE WRITTEN ENERGY CONTROL PROCEDURE

A sample energy control procedure, patterned after examples provided by OSHA, is attached to this bulletin. This sample procedure can be used simply by retyping the material presented and filling in the blank spaces with information specific to your company's operations. It can also be used as a guide to develop a more specific or detailed lockout/tagout procedure. This sample can easily be adapted by most screw machine products companies to account for energy source and control information for different groups of machines (i.e. cam operated screw machines, CNC, chuckers, secondary equipment, etc.). The sample also includes a lockout/tagout procedure checklist which can be used when applying a lockout or tagout device.

ENERGY CONTROL PROCEDURE
FOR
(name of company)

I. Purpose

This procedure establishes the minimum requirements for the lockout or tagout of energy isolating devices. It shall be used to ensure that machines or equipment are isolated from all potentially hazardous energy, and locked out or tagged out before employees perform any covered servicing or maintenance activities where the unexpected energization, start-up or release of stored energy could cause injury.

The following types of energy found in our plant and the magnitude of their hazards are covered by this procedure:

(Insert list of machine groups, types of energy, and magnitude of energy)

II. Responsibility

Appropriate employees shall be instructed in the safety significance of the lockout and/or tagout procedure. Each new or transferred employee and other employees whose work operations are or may be in the area shall be instructed in the purpose and use of lockout and/or tagout procedures.

The following job titles are classified as **authorized** employees for purposes of this Procedure:

(Insert list of job titles of employees who will be issued lockout/tagout devices and who are authorized to lockout or implement a tagout system on machines)

The following job titles are classified as **affected** employees for purposes of this Procedure:

(Insert list of job titles of employees whose job requires them to work in an area in which servicing or maintenance is being performed)

III. Preparation for Lockout or Tagout

Make a survey to locate and identify all isolating devices to be certain which switch(s), valve(s) or other energy isolating devices apply to the equipment to be locked or tagged out. More than one energy source (electrical, mechanical, or others) may be involved.

The following types of energy isolating devices, along with their locations, can be found in our plant:

(Insert list of all energy isolating devices present in your shop, along with their locations)

IV. Sequence of Lockout or Tagout System Procedure

(1) Notify all affected employees that a lockout or tagout is going to be implemented and the reason for the lockout/tagout. The authorized employee shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards pertaining to that energy.

(2) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).

(3) Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s). Stored energy (such as that in springs, elevated machine components, rotating flywheels, hydraulic systems, air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.

The following types of stored energy are associated with the machines and equipment listed under item I above:

(Insert description of all different types of stored energy which could be present in the equipment listed above)

(4) Lockout and/or tagout the energy isolating devices with assigned individual lock(s) or tag(s).

We have selected the following method to comply with the energy isolating requirements of the OSHA standard:

(Insert description of isolating method or methods to be used: i.e. locks, tags, other safety measures which meet the requirements of the Standard)

(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 controls to "neutral" or "off" position after the test.

(6) The equipment is now locked out or tagged out.

V. Restoring Machines 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 machines or equipment to ensure that no one is exposed.

(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 or tagout devices. Operate the energy isolating devices to restore energy to the machine.

VI. Procedure Involving More Than One Person

If more than one person is required to lockout or tagout equipment, each shall place his/her own personal lockout device or tagout device on the energy isolating device(s), using procedures stated above. When an energy isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) may be used. If lockout is used, a single lock may be used to lockout the machine or equipment with the key being placed in a lockout box or cabinet which allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet. As each person no longer needs to maintain his/her lockout protection, that person will remove his/her key from the box or cabinet.

When group lockout/tagout is to be used, management will assign one member of the group as the **authorized employee** for those group members.

VII. Basic Rules for Using Lockout or Tagout System Procedure

All equipment shall be locked out or tagged out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. do not attempt to operate any switch, valve, or other energy isolating device where it is locked or tagged out.

LOCKOUT/TAGOUT PROCEDURE

FOR

(insert name of company)

- (1) **Type(s) and Magnitude(s)** of energy and hazards
- (2) **Name(s)/Job Title(s)** of employees authorized to lockout or tagout
- (3) **Name(s)/Job Titles(s)** of affected employees and how to notify
- (4) **Type(s) and Location** of energy isolating means
- (5) **Type(s) of Stored Energy** and methods to dissipate or restrain
- (6) **Method(s) Selected** i.e. locks, tags, additional safety measures, etc.
- (7) **Type(s) of Equipment** checked to ensure disconnections
- (8) **Name(s)/Job Title(s)** of employees authorized for group lockout or tagout