AFSCME
Health & Safety Fact Sheet

CONTROL OF HAZARDOUS ENERGY
(Lockout Tagout)

Many workplace accidents are caused by machinery that accidentally becomes activated while being serviced or maintained. This accidental activation is called an "uncontrolled released hazardous energy." Many of these accidents can be prevented if the energy sources are isolated, and locked or tagged out.

The Occupational Safety and Health Administrations (OSHA) has a regulation on the *control of hazardous energy (Lockout/Tagout).* This regulation, (29CFR 1910.147) helps safeguard employees from hazardous energy while they are performing service or maintenance on machines and equipment. The OSHA regulation requires that the employer have documented clearance procedures to ensure that machinery does not start up while an employee is working on it.

IDENTIFYING HAZARDOUS ENERGY

Hazardous energy can found in the workplace in different forms. The most common form of energy is electrical, but mechanical, hydraulic, pneumatic, chemical, and thermal energy can also be dangerous.

Energy can also mean movement of the possibility of movement.

There are two types of energy.

Kinetic energy is the force caused by the motion of an object. A spinning wheel is an example of kinetic energy.

Potential energy is the force stored in an object that is not moving. A spring under tension is an example of potential energy. Garbage compactors and gravel crushers are also examples. Potential energy can also be the *potential* energy from suspended parts or springs.

Whenever any part of the body is exposed to these types of energy while servicing or maintaining equipment, lockout/tagout procedures must be followed.

WHAT IS LOCKOUT/TAGOUT?

To keep equipment from being energized during repairs or maintenance, it can often be **locked out**. An *energy isolating device* (the disconnect switch or valve) is placed in the off position. A lock, either combination or key, is then placed over the energy isolating device. This lock remains over the energy source until servicing or maintenance is completed.

A piece of machinery is **tagged out** when the machine is turned off and *tag* with a written warning is attached to the disconnect switch, circuit breaker or valve or other energy isolating device. The purpose of the tag is to assure that the equipment will not be operated until the tag has been removed. Tags used with the lock also identify the employee who is servicing the equipment.

NOTE: Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

WHEN IS LOCKOUT/TAGOUT NEEDED?

Lockout/Tagout is required in general industry employment where servicing and maintenance of machines and equipment could cause injury to employees due to unexpected startup or release of stored energy. Such situations could occur when repairing electrical circuit, cleaning or oiling machinery with moving parts, or clearing jammed mechanisms.

AFSCME members have been killed while attempting to unjam garbage compactors, rock crushers and loaders. Others have been scalded to death and drowned because the valves had not been adequately locked out.

Some examples of machine maintenance requiring lockout/tagout are listed below:

- The employee must either remove or bypass machine guards or other safety devices, resulting in exposure to hazards at the "point of operation." (The point of operation is an area on a machine or piece of equipment where work is actually done upon the material being processed);

- The employee is required to place any part of his or her body in contact with the point of operational machine or piece of equipment.

- The employee is required to place any part of his or her body into an area on the machine where it could be caught by moving parts.

WHAT DOES OSHA REQUIRE?

OSHA requires employers to establish a **lockout/tagout program** that will:

- Use energy control procedures, employee training and periodic inspection to ensure that machines or processes cannot be started while an employee is repairing, servicing or maintaining.

- Ensure that new or overhauled equipment be designed to accept lockout devices;

Lockout is often bypassed because it is difficult and takes too much time when there may be pressure to get a piece of equipment back on line. To avoid the temptation to bypass lockout procedure, lockout should be as easy and as fast as possible. OSHA requires that conveniently located lockout points must be designed and installed into machinery and equipment, whenever replacement or major repair, renovation or modification of a machine is performed.

- Use a tagout program when locks cannot be used. The tagout program must provide employees with a level of safety equal to that obtained by using a lockout program. Note: Tagout is not as effective as lockout, because tags can be bypassed. In some cases, OSHA also allows tags to be used instead of locks. (see below)

- Establish procedures for release of the lockout/tagout that includes machine inspection, notification and safe positioning of workers and removal of the lockout/tagout device; and

- Obtain locks, tags, chains, wedges, key blocks, adapter pins or self-locking fasteners that identify the employee using them. Locks and tags must be able to withstand the environment to which they are exposed for any extended period. For example, tags used outside should have a plastic covering.

Tagout vs. Lockout

OSHA prefers the use of locks instead of tags when controlling hazardous energy because locks provide a physical restraint. They can-not be removed without a key. The key is in the possession of the employee working on the machine.

Tags are not as effective because they can be removed or ignored by someone who is not aware that the machine is being repaired.

Tags may only be used in two situations:

1. When locks cannot be used.

2. When the employer can demonstrate that a tagout system will provide *full employee protection.* Full employee protection is a strict set of procedures that employers must follow to ensure that employees are provided with *the same level of safety as using lockout procedures.*

These may include: removing a valve handle, blocking a controlling switch or other measures that will reduce the potential for any accidental energization while tags are attached.

Note: AFSCME agrees with OSHA that lockout is safer than tagout. Always make sure your employer uses lockout procedures whenever possible. If the employer insists on using only tagout procedures, the union safety committee should take extreme care to make sure that the employer has met all of the standard's requirements.

Tagout Program

When the tagout program is used, it is essential that employees be trained in the limitations of the tags. For example:

- Tags are only *warning devices*. They do not provide the physical restraints that the locks do.

- Tags can provide a *false sense of security* and their meaning may not be understood if all affected employees have not been properly trained.

- It is easier to *bypass or ignore a tag* or remove it without authorization.

- Tags may not be effective unless they are *legible and understandable* by all authorized and affected employees, and all other employees who may work in the area.

- Tags can fall off or be knocked off unless they are *secured attached*.

Lockout/Tagout Equipment

- Lockout and Tagout devices must be durable and substantial so that they can withstand the environment. Wet conditions or chemicals (such as acids) used in the vicinity must not destroy the tags or make them unable to be read. They must be attached so that they cannot accidentally fall off or be easily removed. Simple cardboards tags attached by string or wire are **not** permitted. Tags used outside should be in plastic covers.

- Both lockout and tagout devices must be standardized according to their color, shape or size. Tagout devices must also be standardized according to print and format. This means that only the employer's devices can be used for lockout-tagout.

- Locks and tags should be identifiable. They show the identity of the employees who applied the device.

- Tags must also warn against hazardous conditions with messages that read "DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE or DO NOT OPERATE."

Applying Lockout/Tagout

- In preparation for lockout/tagout, the employee and supervisor should agree on the equipment being taken out of operation and type and amount of the energy which needs to be controlled. All employees who will be affected by the lockout/tagout should be notified and advised of the reason.

- The machine or equipment must be shut down in the normal fashion (pushing the "stop" button, closing a valve, throwing a switch, etc.) to avoid any additional hazards to employees.

- The authorized employee(s) who will service the equipment should locate and identify all energy-isolation devices. Locking out one source of power to a piece of equipment may not be enough. Some machines use a combination of power supplies. If the main power source has been turned off, then so should the backup generator.

- Locks should be attached to each energy-isolating device in a way that will hold device in a "safe" or "off" position. Tags must be put in the same location a lock would be placed. Only the locks and tags supplied by the employer are to be used. Every employee in the work crew must attach his or her personal lock. More than one employee can lock out a single energy isolating device by using a multiple lock hasp.

- If tags are used instead of locks, attach them at the same point as you would a lock, or as close as possible where they will be immediately obvious to anyone attempting to operate the device. Remember, the tags must be filled out completely and correctly.

- Steps must be taken to guard against energy left in the equipment after it has been isolated from its energy sources. For example, the authorized employee(s) must make sure that all parts have stopped moving, tension in springs have been released, piping systems have been drained, valves have been closed and lines have been blocked.

- Use a lockout device if your lock cannot be placed directly on the energy control. A lockout is a device that physically keeps the machine from being turned on, operating or releasing energy.

  When this device is used, each employee in the work crew must attach his or her personal lock. Lockouts are design to hold many padlocks. This provides additional protection for the entire service team since the controls cannot be operated until each member of the team has removed his/her lock. Keys for the locks should remain with and be used only by the employees working on the job.

- Before starting work on locked out equipment, authorized employees must know that the equipment has been deenergized by showing that the main disconnect switch or circuit breaker can't be moved to the position, by pushing buttons or other normal operating control(s) and/or by other tests to make sure that the equipment will not operate.

Release From Lockout/Tagout

1. Before the last lock or tag is removed, the employee should check to ensure that all tools have been removed from the work area and the system is completely assembled.

2. As each employee completes his or her repairs, they should each remove their own lock or tag.

3. When all employees are clear of the hazards, all employees who work in the area are notified the lockout/tagout is being removed

4. The supervisor is then advised that the equipment is ready to be put back in service.

Periodic Inspections

Periodic inspections of the energy control procedures must be performed annually by an authorized employee. The inspection s must review lockout and tagout procedures and correct any deficiencies.

Training

As important as a lockout/tagout program is, it can only be effective if employees are aware of the program and are trained properly.

Three types of employees are covered by the standard: *authorized, affected, and other*. The amount and type of training that employees receive depends on their job in relation to the machine that is being locked out of tagged out.

Authorized Employees: Employees who are authorized to execute the lockout/tagout and perform the servicing or maintenance should receive training in the:

- recognition of all applicable hazardous energy sources (electrical, mechanical, hydraulic, pneumatic, chemical and thermal),
- details about the type and size of the hazardous energy sources present in the workplace, and
- methods necessary for controlling and isolating the energy source.

Authorized employees must possess the knowledge and skills necessary for the safe application, use and removal of energy controls.

Affected/Other Employees: *Affected* employees (usually the machine operators or users) and all other employees whose work operations may be in the area of the energy controls need to recognize when the control procedure is set in motion. They also need to understand the purpose of the procedure and the importance of not using or starting up any equipment or machines that are locked out or tagged out.

Retraining: Employees should be retrained whenever there is a change in their job assignment, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

The retraining should make sure that employees are still able to conduct lockout-tagout procedures and should include information about any changes in procedures. Employers must certify that training of employees has been accomplished and is being kept up to date. The certification should contain the employee's name and dates of the training.

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For more information about protecting workers from workplace hazards, please contact the AFSCME Research & Collective Bargaining Department, Health and Safety Program at (202) 429-1215. You can also contact our office located at 1625 L Street, NW Washington, DC 20036.