CONTROL OF HAZARDOUS ENERGY

Lockout/Tagout

Introduction

Control of Hazardous Energy, or Lockout/Tagout - 29 CFR 1910.147, went into effect January 2, 1990. It helps safeguard employees while they are performing servicing or maintenance activities on machines and equipment. The standard identifies practices and procedures necessary to shut down and lock out or tag out energy sources associated with the machines or equipment, requires that employees receive training in their role in the lockout/tagout program, and mandates that periodic inspections be conducted to maintain or enhance the energy control program.

Where existing standards specify lockout procedures, this standard augments those rules by requiring development and utilization of written procedures, training of employees, and periodic reinspections. OSHA specifically indicates that lockout procedures are specifically more reliable in controlling unexpected energization of equipment than tagout, and is the preferred method of control.

Before servicing or maintenance is performed on equipment or machinery, the machinery or equipment must be turned off and disconnected from the energy source(s), and energy isolating device(s) must be locked or tagged out.

Scope and Application

The lockout/tagout standard applies to general industry employment, and specifically covers the servicing and maintenance of machines and equipment in which the unexpected start-up, energization, or release of stored energy could cause injury to employees. Servicing or maintenance tasks which do not entail potential exposure to the unexpected release of hazardous energy, are not covered by the standard. The standard is a minimum guideline for potential exposure and control of hazardous energy.

Specific Exclusions

* Servicing or maintenance of *cord and plug* connected electrical equipment. The potential hazards must be controlled by unplugging the equipment from the energy source; the plug must be under the exclusive control of the employee performing the service of maintenance of the equipment

* *Hot tap operations* that involve transmission and distribution systems for gas, steam, water, or petroleum products in pressurized pipelines; when continuity of service is essential and shutdown of the system is impractical; and employees are provided with alternative type protection that is equally effective

* Normal production activities and operations - whenever machines or equipment are used for their *normal production operations*. These hazards are covered elsewhere in the General Industry Standard (29 CFR 1910)

* Minor servicing tasks; minor tool changes and adjustments and/or other servicing during normal production operations that are *routine, repetitive, and integral* to the use of the production equipment, provided the work is performed using alternative measures that give effective protection

* Making *fine* adjustments which require a power-on condition, and when the power is on, such as some troubleshooting, centering conveyors belts, centering band saw blades

Specific Inclusions

* Any servicing or maintenance activity performed *during* production, such as lubricating, cleaning, and unjamming production equipment; and the employee performing the servicing may be subjected to hazards that are not encountered as part of the production operation itself

* The employee performing the service or maintenance must either remove or bypass machine guards or other safety devices, resulting in exposure hazards at the point of operation

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

* The employee is required to place any part of his or her body into a danger zone associated with the machine or operating cycle

* Any normal servicing tasks, such as setup or making *significant* adjustments to machinery, which do not take place during normal production operations, and the employee performing the service is potentially exposed to unexpected energization of the equipment

* Making *fine* adjustments when the adjustment does not require a power-on condition, and when the power is off

* Testing or repositioning which requires a power-on condition, only permits removal of locks and/or tags for the duration of the testing or repositioning, and requires that the full lockout/tagout program be implemented for the service and maintenance being performed which requires testing and repositioning

Basic Requirements and Provisions for Compliance

Establish an energy control program, including procedures for isolating machines or equipment from the input of energy and affixing appropriate locks or tags to energy-isolating devices to prevent any unexpected energization, start-up, or release of stored energy that would injure workers. When tags are used on energy-isolating devices capable of being locked out, the employer must provide additional means to assure a level of protection equivalent to that of locks. The standard also requires the training of employees, and the periodic inspections of the procedures to maintain or improve their effectiveness.

Basic procedures for implementation of the various components of the lockout/tagout program are delineated in the following sections. For information specific to particular pieces of equipment, please refer to Appendix A - Lockout/Tagout Procedures and Energy Sources for Specific Equipment.

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout or tagout. Authorized employees are required to perform the lockout in accordance with this procedure. All affected or other employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance, shall not attempt to start, energize or use that machine or equipment. Type of compliance enforcement to be taken for violation of the above.

A written energy control program addresses the procedures to be followed whenever equipment or machinery is serviced or maintained and the potential for exposure to unexpected energy release exists. *Authorized* employees are those who perform the service and maintenance activity and actually implement the lockout/tagout procedures. *Affected* employees are those who are generally equipment or machine operators, and whose jobs, equipment and machinery have been disrupted and shut down for service and maintenance. *Other* employees are those who may be in the vicinity or area during the shut down and who may see equipment and machinery being serviced or maintained under an implemented lockout/tagout program.

A complete energy control program includes the following components:

Energy Control Procedures

* Lockout/Tagout Devices
* Application of Controls and Lockout/Tagout Devices
* Removal of Lockout/Tagout Devices

Employee Training

Periodic Inspections

Additional Safety Considerations

* Testing or Positioning of Machines
* Outside Personnel/Contractors
* Group Lockout or Tagout
* Shift or Personnel Changes

Energy Control Procedures

Energy control procedures are to be implemented whenever service or maintenance is to be performed on equipment, and authorized employees who are performing the service or maintenance, affected employees, or other employees are potentially exposed to unexpected release of energy associated with the equipment or machinery. It includes the procedures for shut down, isolation, blocking, and securing machines and equipment; designation of safe placement, removal and transfer of lockout/tagout devices and who has responsibility for these devices; and specific requirements for testing machines or equipment to determine and verify the effectiveness of locks, tags, and other energy control measures.

Lockout and Tagout Devices

Locks and tags are tools to be used to protect employees from hazardous energy. The lockout device holds energy-isolation devices in a safe position, preventing the equipment or machinery from being inadvertently or unexpectedly re-energized. The tagout device notifies all authorized, affected, and other personnel that the energy-isolation device is a source of potential danger, that the device and the equipment being controlled is not to be operated until the tag has been removed.

Locks shall be used in conjunction with identification tags assigning the lock to the authorized individual and warning that the controlled equipment or machinery is not to be operated until the lock and tag are removed. Locks shall be keyed padlocks with single keys assigned to individual authorized persons - one key, one lock, one person.

Locks and tags are durable, capable of withstanding the environment in which they are to be used. Tags are laminated and are attached with nylon wire-ties.

Refer to examples for durability, substantialness, and uniformity/standardization.

Basic Procedures (for specific procedures see Appendix A)

1. Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the service or maintenance

2. Refer to the company procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, understand the hazards of the energy, and implement the methods to control the energy

3. Shut down the equipment or machinery using the normal shut down procedures

4. Isolate the machines or equipment from energy source(s)

5. Apply the lockout and/or tagout devices to the energy-isolating devices with assigned locks and tags

6. Safely release or restrain all potentially hazardous stored or residual energy by grounding, blocking, etc.

7. Verify isolation of machines or equipment prior to servicing or maintenance by assuring that no personnel are exposed, and operating the normal start-up routine for the equipment or machine. Return operating controls to the off or neutral position prior to service or maintenance

8. Complete service or maintenance

9. Assure that machines or equipment components are operationally intact

10. Notify affected employees that lockout or tagout devices have been removed

11. Assure that all employees are safely positioned or removed from equipment prior to start-up

12. Assure that all tools and extraneous equipment used for service or maintenance is removed from the machinery or equipment serviced

13. Verify that operational controls are in the off or neutral position

14. Removal of the lockout or tagout devices from the energy-isolating device by the authorized employees who applied the device

15. Notify affected employees that the equipment or machinery is now ready for use

Employee Training

Authorized employees will receive the following training and will be certified for same:

* Types and magnitude of hazardous energy sources

* Types and magnitude of energy sources utilized for specific pieces of equipment or machinery

* Methods and means to isolate and control these energy sources

* Elements of the energy control program and procedures

Affected and Other employees will receive the following training and will be certified for same:

* Ability to recognize when the control procedure is being implemented

* Understand the purpose of the procedure and the importance of not attempting to start up or use the equipment that has been locked or tagged out

Retraining will be provided whenever there is a change in job assignments, a change in machines, or a change of equipment or processes, that present a new hazard or a change in energy control procedures; and when periodic reinspections indicate deficiencies or inadequacies in the program.

Periodic Reinspections

Periodic reinspections will be performed and certified at least annually for each authorized employee and all affected machinery and equipment, or when changes occur which may affect the lockout/tagout procedures. The reinspections will include determination that the lockout procedures continue to be implemented, that employees are properly familiar with their respective procedures, the specific requirements for each piece of equipment and machine, and the limitation of tags in place of lockouts.

Additional Safety Requirements

Testing and Repositioning

During testing or repositioning during servicing, the lockout or tagout devices may be removed temporarily for re-energization when it is necessary to provide power to the equipment or machinery for testing or repositioning. Upon re-energization, the following steps will be adhered to:

1. Clear the machine or equipment of tools and materials
2. Remove employees from the machines or equipment area
3. Remove lockout or tagout devices as required by *Basic Procedures* (above)
4. Energize and proceed with testing or repositioning
5. Following repositioning or testing procedures, implement lockout procedure as described by *Basic Procedures* (above)

Outside Employers

When outside employers (i.e., contractors, millwrights) are on the site, the contents of this lockout/tagout program will be provided to that outside employer and its employees, and the outside employer's procedures for use in this facility will be received. A thorough understanding of both sets of procedures will be assured.

Group Lockout or Tagout

During group lockout operations where the release of energy is possible, each authorized employee will attach his or her lockout device as described in Basic Procedures. This affords protection to all servicing personnel, permitting no inadvertent or unexpected start-up while any lockout device remains in place.

Shift or Personnel Changes

When equipment or machinery is being serviced and falls under the requirements of this lockout program, authorized personnel changing shifts or assignments will meet with their replacements and assure that the new lockout devices are placed on the energy-isolation devices prior to removal of those belonging to the reassigned individual. There will be no time during servicing or maintaining of equipment where a lockout device is not in place as required by this program.

Machinery/Equipment ID: _____

Energy Source and Size	Location of Isolation Device	Lock	Tag	Group

Machinery/Equipment ID: _____

Energy Source and Size	Location of Isolation Device	Lock	Tag	Group