Chapter 11

LOCKOUT TAGOUT PROGRAM

11-1. Purpose. These requirements cover the servicing and maintenance of machines and equipment in which the unexpected energizing or start up of the machines or equipment, or release of stored energy could cause injury to employees. These are minimum performance requirements for the control of such hazardous energy.

11-2. Reference. 29 CFR 1910.147, The Control of Hazardous Energy, (Lockout/Tagout).

11-3. Definitions.

a. Affected Employee. An employee whose job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires them to work in an area in which such servicing or maintenance is being performed.

b. Authorized Employee. A person who locks out or tags out a machine or equipment to perform the servicing or maintenance on that machine or equipment. An affected employee may become an authorized employee when their duties include performing maintenance or service covered under this section.

c. Energy Isolating Device. A mechanical device that physically prevents the transmission or release of energy, including but not limited to, the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a slide gate; a slip blind; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch, and other control circuit type devices.

d. Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

e. Lockout Device. A device that utilizes a positive mechanical 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.

f. Tagout. The placement of a sign on 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.

g. Tagout Device. 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.

h. Zero Mechanical State. Once all energy sources are neutralized, the machine or equipment is in a Zero Mechanical State (ZMS). ZMS includes not only the locking out of electrical energy, but also requires that all kinetic and potential energy be isolated, blocked, supported, retained, or controlled to the extent that such energy will not be released unexpectedly.

11-4. Policy. The program consists of energy control procedures, employee training and periodic inspections to ensure that before any employee performs servicing or maintenance on a machine or equipment where the unexpected energizing, startup or the release of stored energy could occur or cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative.

11-5. Protective Materials & Hardware. Lockout devices and tagout devices shall be singularly identified; shall be the only device(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

a. Durable.

(1) Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

(2) Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

(3) Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

b. Standardized. Lockout and tagout devices shall be standardized within the facility in at least one of the following

criteria: color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.

c. Substantial.

(1) Lockout Devices. Shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(2) Tagout Devices. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having a general design and basic characteristics of being at least equivalent to a 1-piece, all environment-tolerant nylon cable tie.

d. Identifiable.

(1) Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

(2) Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: "Do Not Start", "Do Not Open", "Do Not Energize", "Do Not Operate".

11-6. Periodic Inspection.

a. Supervisors shall ensure that periodic inspections of the energy control procedures are conducted at least annually to ensure that the procedure and the requirements of this regulation are being followed.

b. The periodic inspection shall be performed by an authorized employee other than the one(s) utilizing the energy control procedure being inspected.

c. The periodic inspection shall be designed to correct any deviations or inadequacies observed.

d. Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

e. Where tagout is used for energy control, the periodic inspection shall include a review between the inspector and each

authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected.

f. The supervisor shall document that periodic inspections have been performed. The documentation shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, employees included in inspection and the person performing inspection.

11-7. Training and Communication.

a. Supervisors shall provide training to authorized and affected employees to ensure these employees understand the purpose and function of the energy control program and that the safe application, usage, and removal of energy controls are being applied. Training shall include the following:

(1) Authorized employees shall receive training in hazard recognition of energy sources, the types and magnitude of available energies in the work place, and the methods and means necessary for energy isolation and control.

(2) Each affected employee shall be instructed in the purpose and use of the energy control procedures.

(3) All other employees that work in an area where energy control procedures may be utilized, shall be instructed of the procedures and the prohibitions relating to attempts to restart or re-energize machines or equipment which are locked out or tagged out.

b. When tagout systems are used, employees shall also be trained in the following limitations of tags:

(1) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint of those devices that is provided by a lock.

(2) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(3) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are, or may be in the area, in order to be effective.

(4) Tags and their means of attachment must be made of

materials which will withstand the environmental conditions encountered in the work place.

(5) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(6) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

c. Employee Retraining.

(1) Retraining shall be provided for all authorized and affected employees by their supervisor whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

(2) Additional retraining shall be conducted whenever a periodic inspection reveals deviations from or inadequacies in the employee's knowledge or use of energy control procedures.

(3) The retraining shall re-establish employee proficiency and introduce new or revised control methods and procedures, as necessary.

d. Documentation to show employee's completion and proficiency levels of training. This shall also contain the employee's name and dates of training.

11-8. Energy Isolation. Implementation of lockout or the tagout system shall be performed only by authorized employees.

11-9. Notification of Employees. Affected employees shall be notified of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

11-10. Procedures.

a. The following elements and actions shall be performed in the following sequence:

(1) Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be

controlled, and the method or means to control the energy.

(2) Machine or equipment shutdown. The machine or equipment shall be turned off or shut down using the procedure required by this regulation. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of equipment de-energizing.

(3) Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

(4) Lockout or tagout Device Application.

(a) Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

(b) Lockout devices, where used, shall be affixed in a manner so as to hold the energy isolating devices in a safe or off position.

(c) Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the safe or off position is prohibited.

(1) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

(2) Where a tag cannot be affixed directly to the energy isolating device, the tag shall be safely located as close as possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

(5) Stored Energy.

(a) Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

(b) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

(6) Verification of Isolation. Prior to starting work on machines or equipment that has been locked out or tagged out, the authorized employee shall verify that isolation and de-energizing of the machine or equipment have been accomplished.

11-11. Release from Lockout or Tagout. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

a. The machine or equipment. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

b. Employees.

(1) The work area shall be checked to ensure that all employees have been safely positioned or removed.

(2) Before lockout or tagout devices are energized, affected employees shall be notified that the lockout or tagout devices have been removed.

c. Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. When the authorized employee that applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the Safety Office and the employee's supervisor. Specific procedures shall be developed which will provide the equivalent safety factor as if the removal of the device was being done by the authorized employee that applied it. The specific procedure shall include at least the following elements:

(1) Verification, by the supervisor, that the authorized employee that applied the device is not on the installation.

(2) Making all reasonable efforts to contact and inform the authorized employee that the lockout or tagout device has been removed.

(3) Ensure that the authorized employee, whose device was removed, is informed of the removal before resuming work in the area.

11-12. Additional Requirements.

a. Testing or positioning of machines, equipment or components. In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment, or component thereof, the following sequence of actions shall be followed:

(1) Clear the machine or equipment of tools and materials.

(2) Remove employees from the machine or equipment area.

(3) Remove the lockout or tagout devices.

(4) Energize and proceed with testing or positioning;

(5) De-energize all systems and reapply energy control measures to continue the servicing and/or maintenance.

b. Outside Personnel (contractors, etc.)

(1) Whenever outside servicing personnel are to be engaged in activities covered by the Scope and Application of this regulation, the on-site Contracting Officer's Representative (COR) and the outside contractor shall inform each other of their respective lockout or tagout procedures.

(2) The COR shall ensure that depot personnel understand and comply with restrictions of the contractor's energy control procedures.

c. Group lockout or tagout.

(1) When servicing and/or maintenance is performed by a crew or group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

(2) Group lockout or tagout devices shall be issued in accordance with the procedures required in this section including, but not necessarily limited to, the following specific requirements:

(a) Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock).

(b) Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment.

(c) When more than one crew is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection.

(d) Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lock box device, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

d. Shift or Personnel Changes. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provisions for the orderly transfer of lockout or tagout devices between off-going and incoming employees, to minimize exposure to hazards from the unexpected energizing, start-up of the machine or equipment, or release of stored energy.

11-13. Completing the Lockout or Tagout Procedure Form.

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

c. 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.

d. Sequence of Lockout or Tagout System Procedure.

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

(2) If the machine or equipment is operating, shut it down by the normal stopping procedure; i.e., 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 members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, bleeding down, etc.

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

(5) After ensuring that personnel are not exposed, test the equipment to ensure it cannot become energized.

CAUTION: Return operating control(s) to "neutral" or "off" position after the test.

e. Restoring Machines or Equipment 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 or equipment.

f. Procedure Involving More Than One Person. In the preceding steps, if more than one individual is required to lockout or tagout equipment, each shall place their own personal lockout or tagout device on the energy isolating device(s). 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 or her lockout protection, that person will remove his/her lock from the box or cabinet.