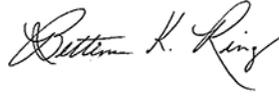


Policy and Procedure 8-17

Workplace Safety – Lockout Tagout

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Codes/Mandates: 29 CFR 1910.147, Control of Hazardous Energy. Establishes the minimum requirements for the lockout or tagout of energy isolating devices. It shall be used to ensure that the machines or equipment are isolated from all potentially hazardous energy and are locked out or tagged out before employees perform any servicing or maintenance activities where the unexpected start-up or release of stored energy could cause injury. LOTO applies to equipment operating at 50 volts or more to ground.

29 CFR 1910 – Subpart S, Electrical Standard. Covers LOTO related safety practices for electrical tasks not covered by 29 CFR 1910.147.

References: N/A

Forms: N/A

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PURPOSE

Serious accidents can happen when people think a machine, or the power to it, is safely shut off. To address this problem, the Occupational Safety and Health Administration (OSHA) enacted its Control of Hazardous Energy Standard, more commonly referred to as the Lockout Tagout (LOTO) Standard. When followed, the LOTO procedures therein protect employees by ensuring that machines remain de-energized while working on them. The LOTO standard outlines the fundamental practices and procedures essential to safeguarding employees from unexpected start-ups of machinery and equipment, and hence the release of hazardous energy, during routine servicing and maintenance activities. VDOF Policy and Procedure 08-017 possess the components that provide compliance with the LOTO Standard.

POLICY

VDOF is dedicated to providing a safe work environment for its employees. This includes having a hazardous energy control policy with procedures that prevent the release of hazardous energy from uncontrolled sources – sources that could injure people who are working on equipment or machines. Per OSHA Standard 29 CFR 1910.147, VDOF implements an energy isolation and control program. This program shall possess the components that provide compliance with 29 CFR 1910.147. Employees to whom this standard applies are encouraged to embrace the intent of the regulation and are required to act in accordance with the procedures set forth in the policy.

DEFINITIONS

“Affected employees” are those people who normally use equipment that undergoes repair and maintenance needing LOTO. They may be in the area when equipment is being repaired and are, therefore, affected by LOTO. These people need to be able to recognize when an energy control procedure is being implemented, understand the purpose of the procedure, and understand the importance of not attempting to start up equipment that has been locked or tagged out.

“Authorized service staff” are those people who typically repair and maintain equipment and machinery and perform the actual energy control procedures. They need to understand different types of hazardous energy and the devices used to control and isolate associated hazards. In addition, they need to have the proper knowledge and skills required to apply LOTO procedures and devices. Authorized service staff are usually electricians, maintenance mechanics, building managers and other staff with expertise and/or repair responsibilities.

“Lockout” refers to locks that are used as physical barriers to prevent switches from being activated or valves from being turned.

“LOTO” is the term commonly used when referring to the shut down or de-energizing of equipment or machines prior to them being serviced. LOTO is a system of safety procedures used to prevent equipment from accidentally being started while servicing is taking place.

“Other staff” refers to people who are typically not near to equipment that undergoes LOTO (office workers for example). These people should at least have an understanding of what LOTO is and the importance of these procedures.

“Tagout” refers to written warnings alerting people to the fact that work is being performed on a piece of equipment and not to try and operate it.

PROCEDURES

Responsible Parties

Agency safety officer is responsible for the establishment of the written LOTO program; and selecting and/or developing materials for basic LOTO training.

Designated LOTO foreman(s) is responsible for identifying equipment and machines that require LOTO for service or maintenance; overseeing the development of LOTO procedures; ensuring that annual inspections of procedures are completed; and providing training on specific LOTO procedures for authorized service staff.

Authorized service staff (see definition) is responsible assuring that all precautions and necessary LOTO are in place before commencing repair work on a machine or piece of equipment.

Facility managers and supervisors are responsible for appointing employees as needed to the role of authorized service staff for their work area; identifying any affected employees in their work unit; ensuring that LOTO procedures are completed and available for equipment and machines in their assigned work area; obtaining and providing needed LOTO devices for their work area; ensuring a system for the individual issuance of LOTO devices, and ensuring that direct reports who perform maintenance utilize LOTO as required.

General LOTO

- ◆ Any device or piece of equipment that could expose employees to a release of hazardous energy during service or maintenance will be locked and tagged out.
- ◆ NO attempt shall be made to operate a piece of equipment to which a lock or tag is attached.
- ◆ LOTO is to be performed only by authorized service staff who service or maintain equipment or machines. However, LOTO procedures can be performed on mobile equipment, such as loaders, dozers, forklifts, transports, etc., by operators as appropriate for the protection of staff. This is particularly important when equipment or machines break down and could be subject to usage by employees while awaiting service personnel. One means of doing so is to secure a tag to the vehicle and keep the keys in a secured location until a mechanic arrives.
- ◆ Documented LOTO procedures will be developed, maintained and accessible for all machines and pieces of equipment. Exception: Documentation is not required when all of the following elements exist:
 - the equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down
 - the equipment has a single energy source which can be readily identified and isolated
 - the isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment
 - the equipment is isolated from that energy source and locked out during servicing or maintenance
 - a single lockout device will achieve a locked out condition
- ◆ LOTO procedures will identify energy sources and provide step-by-step instruction for shutting down energy sources, locking or tagging out energy sources, releasing stored energy, and verifying the equipment cannot be re-started after lockout is applied.
- ◆ Written procedures will be developed by qualified VDOF staff or outside consultants.
- ◆ Written LOTO procedures will be maintained on the Virginia Learning Center (VLC) for reference; it is recommended that facilities compile area-specific electronic or hard copy binders.
- ◆ Authorized service staffs will lockout and tagout equipment according to documented LOTO procedures prior to servicing any machine or piece of equipment that could expose employees to an unexpected start-up or release of hazardous energy during service or maintenance.
- ◆ A tagout system alone may be used in lieu of lockout if there is no means of locking out a machine and it provides full employee protection (see [1910.147\(c\)\(3\)](#) for details on determining full protection.)
- ◆ If a machine or piece of equipment is not capable of being locked out, it will be tagged out. The tagout device shall be attached at the same location that the lockout device would have been attached.
- ◆ Lockout and tagout devices:
 - should not be used for any purpose other than LOTO
 - shall be the only devices used for controlling energy
 - will be individually identifiable
 - must be durable enough to withstand the environment in which they will be used
 - will be standardized using the color red as the unifying criteria
 - [Lockout devices] shall be substantial enough to prevent removal without the use of excessive force, such as with the use of bolt cutters or other metal cutting tools.
- ◆ Tags, attachment devices used in LOTO must:
 - Be non-reusable
 - Attachable by hand
 - Self-locking

- Non-releasable
- Be similar in design to a nylon cable tie
- Have a minimum locking strength of 50 pounds
- ◆ Tags used in LOTO must:
 - Be securely attached to the lock as a means of identification
 - Be substantial enough to prevent accidental removal
 - Show the name and contact information of the employee applying the device
 - Indicate the date and time that work began
 - Warn about hazardous conditions that may result if the machine or equipment is energized
 - Include a legend, such as “Do Not Start”, “Do Not Operate”, etc.
- ◆ Authorized service staff must inform all affected employees when a LOTO procedure has been placed into effect and when it is removed.
- ◆ Lockout devices and tags will only be removed by the person who applied them and are not to be bypassed, ignored or otherwise defeated. Exception: In the event that an employee is unavailable to remove his or her lock and it is necessary to complete the lockout procedure and restart the machinery or equipment, a supervisor may authorize a transfer of responsibility to another authorized service staff member, who can then proceed with removing the device and restoring the equipment to operational mode. Before doing so:
 - Verification should be made that the authorized service staff who applied the lock is not at the facility;
 - Reasonable effort must be made to contact the authorized service staff who applied the lock and let him/her know that his/her lockout device has been removed, and
 - Notification must be made to the authorized service staff, upon his/her return to work, that his/her lockout device has been removed.
- ◆ LOTO is not required for:
 - Minor tool changes and adjustments if they take place during normal operations; are routine, repetitive and integral to the use of the equipment, and the work is performed using measures, which provide effective protection. The exception does not apply if the employee must remove or bypass a guard or other safety device or place any part of the body into an area on the machine or piece of equipment where the work is actually performed.
 - Work on cord and plug connected electric equipment for which exposure to hazardous energy can be controlled by unplugging the equipment from the energy source and the plug remains under the exclusive control of the employee. If, for any reason, the employee must leave the vicinity of the machine, a plug cover will be used and a lock will be applied.
 - Hot-tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that continuity of service is essential; shutdown of the system is impractical; documented procedures are followed, and special equipment is used, which will provide proven effective protection for employees.
- ◆ No one shall attempt to operate any switch, valve, or other energy-isolating device which has been locked or tagged out.
- ◆ Before applying energy controls, a survey shall be performed of the equipment to be locked out – the survey will 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.
- ◆ Control of lockout devices/keys:
 - Combination locks are prohibited. At a minimum, a four-pin tumbler keyed padlock shall be used for lockouts.

- Locking devices should be checked when purchased to ensure that no two locks can be opened by the same key.
- Locks may be permanently assigned to an employee or may be generally available to employees. Facility supervisors will ensure a system for availability and issuance of lock and tagout devices that fit their employees' needs.
- If a key is lost, the lock should be turned in and re-keyed or replaced.
- If a lock is lost, the keys should be destroyed.
- ◆ When maintenance is performed on vehicles, including but not limited to passenger, construction, farm, dozers, ATVs and transports, the following LOTO safeguards shall be used:
 - The vehicle shall be placed into park position; parking brakes will be applied.
 - The vehicle shall be shut off and the ignition key will be removed. The key, and all spare keys, shall remain under exclusive control of the person performing maintenance or locked in a lock box.
 - A LOTO tag, with the name of the person who is performing the servicing clearly identified, will be attached to the steering wheel.
 - Master switches, on all equipment supplied with master switches, shall be turned to the off position. A locking device shall be used and a lock and tag shall be applied.
 - The negative battery cable shall be disconnected if working on electrical issues unless the repairs being performed require the battery to be connected for testing purposes.
 - Tires will be chocked if on a grade.
 - All hydraulic equipment (i.e., buckets, blades, plows, forks, etc.) shall be retracted and lowered; if the equipment is caught in an elevated position or must remain in an elevated position when servicing the vehicle, blocking must be applied using stands adequately rated for the weight of the equipment.
 - Depending on the type of repair being performed, ramps shall be in a fully-raised position and secured, or fully lowered.
 - Before working on hydraulic systems with accumulators, all residual pressure shall be relieved. As an additional safeguard, when repairing hydraulic systems, be sure to wear appropriate eye and hand protection.

Steps When Performing LOTO

When performing a LOTO employees will use the following steps:

1. Pre-Shutdown
 - Determine what switches, equipment and people will be involved.
 - Identify all power sources that need to be shut down, including electrical circuits, hydraulic and pneumatic systems, spring energy, gravity systems, etc. Obtain a copy of the machine specific energy control procedure if needed.
 - Notify all affected employees that a lockout or tagout system is going to be utilized and the reason why.
2. Shutdown Equipment
 - If the machine or equipment is operating, shut it down by the normal stopping procedure.
3. Neutralize all Energy Sources
 - Engage/operate the switch, valve or other energy isolating device(s) so that the equipment is isolated from its energy source(s).
 - Dissipate stored energy (such as that in springs; elevated machine parts; rotating flywheels; hydraulic systems; air, gas, steam or water pressure; etc.) or restrain it by methods such as repositioning (e.g., lowering suspended parts to rest positions), blocking parts that could move, bleeding hydraulic and pneumatic lines, etc.
 - Never pull an electrical switch while it is under load and never remove a fuse instead of disconnecting.

4. Lock and Tagout All Power Sources

- Lock and tagout each energy-isolating device, machine control, pressure line, starter switch and suspended part with assigned individual lock(s) and tag(s).
- Affix lockout device(s) in a manner so that it holds the energy isolating devices in a “safe” or “off” position.
- If tags are used instead of locks, attach them at the same point and in the same manner as you would a lock – they must clearly indicate that changing the energy isolating devices from the “safe” or “off” position is prohibited.
- Where a tag cannot be affixed directly to an energy-isolating device, place the tag as close as safely possible to the device and in a position that will be immediately obvious to anyone attempting to operate the device.
- Fill tags out completely and correctly. Tags will include name of person performing the LOTO; how to reach the person; the date and time of tagging, and the reason for the lockout.

5. Verify Isolation of Equipment

- Make sure all danger areas are clear of personnel.
- Verify that the main disconnect switch or circuit breaker cannot be moved to the “on” position.
- Operate the push button or other normal operating controls to make certain the equipment will not operate.
- Turn control(s) to “neutral” or “off” position after the test and proceed with maintenance. During the performance of work, avoid doing anything that could reactivate the equipment.

6. Restore Machines or Equipment to Normal Production Operations

- Account for all tools so that nothing is left in the equipment.
- Reinstall any guards that have been removed.
- Remove all lockout or tagout devices.
- Operate the energy-isolating devices to restore energy to the machine or equipment.
- Notify affected personnel that the lockout or tagout device(s) have been removed.

Basic Group LOTO Procedures

- ◆ When more than one person must lock out an energy source, a group lockout procedure must be implemented under the direction of a designated primary lockout employee. This person will have responsibility for control of the group lockout procedure.
- ◆ Each person participating in a group lockout has the right to personally verify the effectiveness of the lockout procedure
- ◆ When more than one individual must lockout equipment, each shall place his/her own personal lock on the energy isolating device(s).
- ◆ Each lock should have a tag on it identifying the authorized person to whom it belongs.
- ◆ When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout device, such as a hasp, may be used. Alternatively, a single lock may be used to lock out 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 lock from the box or cabinet.
- ◆ If servicing of equipment lasts more than one work shift, LOTO protection will not be interrupted. Employees completing their work assignment and preparing to leave the facility must not remove their lock until the next employee to service the equipment is ready to lockout.
- ◆ The employee who applied the device shall remove each lockout or tagout device from each energy-isolating device. Only after the last employee removes his/her locking device can the machine be restarted. This way each employee is accounted for and safe guarded against an accidental start-up.

- ◆ Exception: When an employee who has applied a device is not there to remove it, and the machine or equipment needs to be restarted, the device may be removed after making reasonable efforts to contact the employee; gaining authorization by a supervisor, and ensuring that the procedure to remove it provides equivalent safety to the removal of the device by the authorized employee who applied it. The primary lockout employee must participate in the removal process.

The Use of Contractors

- ◆ Whenever an outside contractor is used to perform service work that requires LOTO, that contractor's energy control program will be compared to that of VDOF by the supervising employee. Where the programs differ, the stricter procedure will be followed.
- ◆ The supervising employee will ensure that the outside contractor uses appropriate LOTO.
- ◆ Repairmen will provide documented LOTO procedures to the supervising employee for work on energy systems that are not maintained by VDOF employees and therefore do not have documented LOTO procedures.

Training and Retraining

Training is required for authorized service staff and affected employees.

- ◆ Basic awareness level LOTO training will be provided for authorized service staff and affected employees via an on-line course.
- ◆ Machine-specific procedural training will be provided to employees who conduct maintenance or repair of equipment or machines that require LOTO. This training will be provided by qualified in-house employees or contractors.

Retraining shall be provided to authorized or affected employees when:

- ◆ Their job assignments change;
- ◆ New hazards are introduced into the work environment;
- ◆ Energy control procedures change;
- ◆ Inspections reveal deviations from or inadequacies in the energy control procedures, and
- ◆ Inspections reveal deficiencies in the program or staff knowledge.

Training records will be maintained in the state's Learning Management System.

Annual Inspections

LOTO policy and procedures will be reviewed annually. An authorized service staff who is not directly involved with the procedure being reviewed shall analyze how it is carried out and look for weaknesses in the overall process. All employees will be notified of changes to procedures.

AUTHORITY

This policy and procedure is issued by the Virginia state forester.

INTERPRETATION

The director of human resources and agency safety officer are responsible for the interpretation of this policy and procedure.