

Lockout/tagout program



Every year workers are injured or killed as a result of inadequate or nonexistent control of hazardous energy sources. The general workforce, as well as contractors working in industrial environments, need to have effective controls for this exposure.

The control of hazardous energy sources is a procedure to interrupt all power sources and to dissipate, release or block stored energy to prevent unexpected operation of machinery or process systems. The control of hazardous energy is known as a lockout/tagout procedure.

The lockout system is a physical means that is used to control the hazardous energy sources. A tagout procedure is the written warning that tells workers not to operate switches, valves or other equipment that could release hazardous energy or start machinery in motion. Both systems should be used together to reduce injury exposure to employees.

Control of hazardous energy sources is needed when performing maintenance, repair or service work. These controls should be used during normal operation or breakdowns. Unclogging jams or misfeeds also requires a lockout procedure.

Principles of controlling the hazards

There are four principles of a lockout/tagout program that should be understood in controlling this loss exposure.

- **Energy:** Energy sources must be controlled. The sources of this energy can be electrical, mechanical, hydraulic, pneumatic, gravity, chemical or thermal. The energy must be disconnected and dissipated before proper controls are in place.
- **Engineering:** This is the first line of defense in a lockout/tagout program. Interlock systems and other protective systems can be installed to protect the employee from the hazardous energy sources without any action required from the employee.
- **Education:** Training employees is necessary to understand the procedure for everyday operation or in special circumstances, such as shutdowns or major overhauls. Employees of contractors working in the facility must also understand the procedure and principles required to control hazardous energy sources. Per OSHA, the program needs to be written to provide proper training and documentation.
- **Enforcement:** The OSHA standard requires at least an annual evaluation and inspection to ensure proper procedures are being used and followed. The program should contain a clearly stated policy for enforcement of a lockout/tagout.

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The lockout/tagout safety program should be in a written format and should be signed and backed by top management. The minimal lockout/tagout program should contain at least the following items:

- **Policy statement:** A policy statement should outline the scope and purpose for implementing the program. Also, the responsibilities for a lockout/tagout program should be outlined for management, supervisors and employees.
- **Equipment for lockout/tagout procedures:** Lockout/tagout devices need to be issued to employees by management such as: single key padlocks, chains, lock hasps for multiple lockout locations and marking or warning tags. These items should be standardized and easily recognized. Locks should have only one key to be carried by the one employee. Tags should have clear and concise instructions. The tags should be able to be secured to prevent accidental removal and durable enough to withstand environmental conditions.
- **Preparation for lockout/tagout:** The locations to install locks and place tags need to be identified by signs or by schematics of the equipment layout. Preplanning is essential with complex systems or processes since some equipment has more than one energy source or has an auxiliary power source that will need to be controlled.

Lockout/tagout procedures

The procedures should clearly outline the rules and techniques to control the hazardous energy sources. Lockout/tagout procedures should contain at least the following steps:

- **Notification:** Notify all the affected employees that a lockout/tagout system is going to be utilized. The employees should be aware of the affected areas, estimated time applied, and the name of the responsible personnel.
- **Equipment shutdown:** This section should outline procedures for turning off switches or power buttons at the point of operation.
- **Equipment isolation:** The main and secondary power sources need to be turned off and isolated. Complex systems may need more than one location to isolate.
- **Locking and tagging points of control:** The locking hardware and properly completed tag should be placed at predetermined energy isolating locations. Tagout devices should warn against hazardous conditions if the machine or equipment is energized and should include a legend such as the following:

Do Not Start. Do Not Close.
Do Not Open. Do Not Energize.
Do Not Operate.

When the job requires group lockout/tagout, a multiple locking hasp or lockout box should be used.

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- **The dispelling of stored energy:** This section should instruct how to dispel all hazardous energy sources: mechanical, electrical, gravity, pneumatic, hydraulic, thermal or chemical energy.
- **Lockout verification:** When locks and tags are in place, the system should be checked to verify that no hazardous energy remains. Switches should be checked after verification to be sure they have been returned to the off position. Electrical equipment should be de-energized and checked with voltage meters to be sure the electrical circuit is off.

Additional program components

- **Performing work:** As work proceeds, checks should be made to the new systems to ensure lockouts are not bypassed. All shifts should be notified of the lockouts. Specific procedures should be used during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provisions for the orderly transfer of lockout or tagout device protection between incoming and outgoing employees to minimize the exposure to hazards from the unexpected energization or startup of the machine or equipment or the release of stored energy.
- **Testing procedures:** Testing procedures should be outlined to ensure equipment, tools, materials and people are clear of the affected areas before the test begins. Lockout and tagout devices should be reinstalled before work commences after a test.
- **Lock and tag removal:** When work is completed, all tags and lockout hardware should be removed. Workers in the affected areas should be notified of reactivation of the systems. A final check should be made with a check sheet for startup and visible inspections done before actual activation of the equipment or process.
- **Emergency lock removal procedures:** Emergency lock removal procedures should be established, designating two individuals responsible for emergency lock removal when required.
- **Training:** The training section is the last point of a lockout/tagout procedure. The procedure for training and retraining employees and outside contractors should be specifically outlined.
- **Enforcement:** Enforcement must be 100 percent in order to be effective. An annual inspection procedure with documentation should be developed to verify the usage of the lockout/tagout procedure. Disciplinary procedures should be clearly stated for fair and consistent enforcement.

Standards for control of hazardous energy

OSHA Standard, General Industries 29 CFR 1910.147, Control of Hazard Energy Sources.

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