| PROCEDURE NUMBER | Effective Date | |
|---|---|---|
| | Replaces | |
| | Responsible Dept. | |
| | Issued By | |

# Control of Hazardous Energy (Lock-out/Tag-out)

## 1. Purpose and Scope

Serious and potentially fatal injury can result from the sudden, unexpected start-up or energization of equipment or machinery during installation, service, set-up, inspection, maintenance, or repair activity. Without proper procedures and precautions hazardous energy or materials can be released accidently resulting in personal injury, fire or explosion.

Hazardous energy can take many forms, including, but not necessarily limited to: electrical, mechanical, pneumatic, hydraulic, and thermal, as well as potential (stored) energy such as that created by gravity (hazard of falling objects/components) or springs which are under compression or tension. Hazardous materials such as flammable gases (natural gas or propane) or liquid corrosives can be unexpectedly released causing personal injury, property damage, or contamination of the natural environment.

Lock-Out/Tag-Out (LOTO) is a program designed to ensure that only trained and qualified individuals work on machinery and equipment, and only when following established procedures so that all forms of energy can be effectively identified and properly isolated.

## 2. Application

This procedure applies to the control of energy during installation, servicing and/or maintenance of all machinery and equipment, including associated services such as electrical wiring/conductors, compressed air, piped gas, etc. Servicing and/or maintenance which take place during normal production operations are covered by this policy and associated procedures if:

- An employee is required to remove or bypass a guard or other safety device; or
- An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle: or
- An employee is asked to perform “manipulative” work on potentially live electrical equipment or circuits

*If service is being performed on plug-controlled/plug-in equipment, and electricity is the only hazardous energy, and the plug is in the complete control and within immediate grasp of the person performing the servicing, repair or maintenance activity, then a full lock-out/tag-out is not required.*

## 3. Program Elements

Responsibilities

*Location Managers are responsible for:*

- Identifying and qualifying those individuals that are permitted, by virtue of demonstrated skill and training, to perform repair or maintenance activity on equipment or machinery (hereto referred as “Authorized Employee”)
- Training of all “Authorized” employees on the requirements of the LOTO program  Training of all “Affected” employees, those who are not performing the actual repair but who need to recognize a lock-out/tag-out and understand what actions are necessary to protect themselves and the ‘Authorized” employee
- Maintaining accurate documentation of all required training
- Maintaining an accurate inventory all machinery and equipment covered by the program
- Ensuring that machine/equipment-specific LOTO procedures are developed using the _____ LOTO form for all machinery and equipment on the inventory
- Performing periodic audits of the LOTO program to ensure that all requirements are being met

*All employees must:*

- Attend and fully participate in all required training
- Never attempt to work on or repair machinery or equipment unless they are authorized, and then only when following the written LOTO procedure for that particular piece of equipment
- Never remove, disable or otherwise tamper with a machine guard or safeguarding device (guarding only to be removed under LOTO for necessary repairs or adjustments)
- Never interfere with a LOTO in process, including adherence to all instructions issued by the “Authorized” employee
- Immediately bring to management’s attention any hazards, concerns, or identified problems associated with machinery and equipment, including instances where required LOTO procedures are not being followed.

*The EHS Department is responsible for:*

- Providing consultative assistance in the design and implementation of a written LOTO Program as requested
- Providing technical assistance in identifying and controlling hazardous energy, including support in developing machine-specific energy isolation procedures
- Performing periodic audits of the program to help ensure compliance with OSHA regulation and company policy, as well as to offer suggestions to address any deficiencies identified

Training

The Authorized Employee must be trained, at a minimum, in:

- the facility energy control/LOTO program with unrestricted access to all associated documentation,

- how to recognize all hazardous energy sources that may be encountered,
- the type and magnitude of the energy located in the workplace,
- the specific procedures for energy isolation and control including specific procedures developed for equipment and systems,
- the prohibition and penalties for attempts to work on equipment which has been not been locked-out and placed into "zero mechanical state", and
- the requirement to immediately report any observed violations of this policy to the location manager or an EHS Department representative.

All employees whose equipment will be serviced or who work in the immediate area where lockout/tag-out may be utilized, must be trained in the basics of the LOTO program, most importantly on the prohibition on attempting any restart or operation of machines or equipment which are locked-out and tagged. These employees are not required to be familiar with the specific lock-out/tag-out procedures for each machine or system.

"Authorized" employees must be fully trained before being allowed to work on any equipment, machine or process that necessitates a lock-out/tag-out. Prior training with a former employer or agency is not acceptable in lieu of training by _____ and must cover facility specific programs and procedures. "Affected" employees must be trained before any servicing and maintenance is performed on any equipment or machine that they might operate.

Retraining (or refresher training) will be conducted whenever one of the following exists:

- The employee has a change in job assignment;
- There has been a significant change in the equipment or process;
- There has been a change in the energy control procedure;
- There has been an accident (including near miss) which is attributed, in whole or part, to failure to lock-out properly;
- Anytime an employee is observed violating the policy
- Anytime an audit or inspection reveals deviations from standard procedures or from obvious inadequacies in employee's knowledge or use of lock-out/tag-out procedures.

## Energy Isolation Procedures

A machine/equipment-specific energy isolation procedure must be developed before any work or servicing can be performed. The procedure will be prepared using the standard _____ LOTO template which must identify the type and magnitude of hazardous energy, the location and operation of energy isolation devices, the specific sequence of energy isolation (when required), the specific checks to confirm that the energy has been isolated and dissipated, and procedures necessary to safely restore machinery or equipment to operation. *(See Appendix I - Equipment-Specific Energy Isolation Procedure Template and Appendix II - Instructions for Completing Energy Isolation Procedure).*

## Sequence of Lock-Out

Every Lock-Out will be completed and documented in the following order. No step will be skipped or performed out of sequence.

1. *Notification of Employees*: Affected employees shall be notified by either the authorized employee of the application and removal of lock out/ tag out devices or the safety coordinator prior to instituting controls, and after the controls are removed from the machine or equipment.

2. *Preparation for Shutdown*: Before an authorized or affected employee turns off a machine or equipment, the authorized employee (usually a maintenance mechanic) shall review the machine/equipment-specific procedure to understand the type and magnitude of the energy, the hazards of the energy to be controlled, and the methods or means to control the energy.

3. *Machine or Equipment Shutdown*: The machine or equipment shall be turned off or shut down using the procedures established specifically for that machine or equipment. This means an orderly shutdown must be always be performed to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

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

5. *Lock-out or Tag-out Device Application*:

    a. Individually keyed locks and tags shall be affixed to each energy isolating device by authorized personnel *only.* Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

    b. Lock out devices shall be affixed in a manner that will hold the energy isolating devices in a "safe" or "off' position.

    c. Tag shall be affixed in such a manner that will *clearly* indicate that the operation or movement of energy isolating devices from the "safe" or 'off" position is prohibited, and include the name and contact information of the "Authorized" employee that has applied the lock.

6. *Stored Energy*: Following the application of lock-out devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe. This includes situations in which 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.

7. *Verification of Isolation:* Prior to work on machines or equipment that have been locked-out and tagged, the authorized employee shall verify that isolation and de-energization of the machine or equipment has been accomplished.

Restoring Equipment to Operation

Before lock-out devices are removed and energy is restored to the machinery or equipment, the following steps must be taken by the authorized employee(s):

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

- All guards and safety devices have been re-installed and restored to designed operational condition.

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

- The work area shall be checked to ensure that all tools, extension cords, portable equipment, etc. have been removed and accounted for.

- After lock out or tag out devices have been removed and before a machine or equipment is started, Affected employees shall be notified that the lock out or tag out device(s) have been removed.

- The Authorized employee should remain with the Affected employee until the equipment is determined to be operating within acceptable parameters and that there are no remaining problems or issues that may need to be addressed.

Protective Materials & Hardware

The Location Manager shall provide locks, tags, blocks, and any specific devices as required by the machine/equipment-specific energy isolation procedure, to effectively isolate, secure and block machines or equipment from all energy sources.

Lock-out devices must be singularly identified and used only for controlling energy and no other purposes. These devices must also be:

Durable: shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected

Standardized: lock-out devices shall be standardized in at least one of the following criteria: color, shape or size. Tags should be standardizes as to print, format and message.

Substantial: lock-out devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques (so as the use of bolt cutters or other metal cutting tools). Tags, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal.

Individually keyed: padlocks must be individually and uniquely keyed so that only the "Authorized" employee can remove an isolation device under their control. Only the Location Manager may have a duplicate key which can be used only in very specific cases *(see "Special Considerations - Removal of Lock-out by Others")*

Identifiable: tags affixed to locking devices shall indicate the date installed and the identity of the employee(s) applying the device.

Warnings: the tag shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as “Do Not Start”, “Do Not Open”, “Do Not Operate”, etc.

Approval: only lock-out and tag-out devices approved by the location manager or EHS department shall be used.

## Outside Contractors

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application the contractor must be made aware of the facility energy control program and must follow all related requirements. The contractor must demonstrate that all employees who will be performing work in the capacity of an “Authorized” employee have been fully trained and are aware of all required energy isolation procedures. Where both _____ employees and contractors will be working on a joint project, and where a group lock-out will be employed (see below), a decision must be made in advance as to who will serve in the capacity of project supervisor (i.e., who will manage the lock-out).

The supervising department and/or EHS Manager/Coordinator will notify all affected _____ employees of the contractor's scope and approximate duration of work to the machinery or equipment.

## Special Considerations

### *Group Lock-Out*

Whenever more than one Authorized employee must work on the same machine or piece of equipment, a group lock-out/tag-out must be used. Every Authorized employee assigned to that project/task is required to install their own lock-out/tag-out device for the duration of their work on the machine. No employee will install, remove, change or deface any other employee’s lockout/ tag-out device. In a group lock-out situation one employee must be designated (usually the senior or most experienced employee) to supervise the process. This individual will ensure that ***all*** group members are fully protected by the LOTO procedure.

### *Shift or Personnel Changes*

In the event that a shift change occurs during a LOTO situation, authorized employees may remove their lock/tag and have their replacement, who is reporting to work on the current shift, lock-out/ tag-out the machine in question with their own lock and tag. When this occurs the lock out/tag out devices are to be exchanged in the presence of the two authorized employees so as not to leave the machine exposed to energy at any time. The “Authorized’ employee will never remove an energy isolation device until safe to do so. Any authorized employee who leaves his lock/tag over the following shift must report such actions to the supervisor of the next shift.

### *Removal of Lock-Out by Others*

Occasionally, an “Authorized” employee may forget to remove an energy isolation device or is otherwise not available to complete the duties initially assigned. In this case only the Location Manager may remove the device(s) in the employees absence provided a documented

procedure is followed. At a minimum, this procedure shall include, but not necessarily be limited to, these actions by the manager:

1. Verifying that the “Authorized” employee is not on site; question other employees as to their known whereabouts,
2. Making all reasonable efforts to contact the “Authorized” employee to inform him/her that their lock-out/tag-out device has been removed;
3. Having another “Authorized” employee, in consult with operators (Affected Employees) ensure the equipment/process is safe, and
4. Restart equipment/process after a thorough check that all safety guards and devices are operational, that there are no employees in a danger zone, and that all tools, parts, etc., have been safely removed.

**Program Audit and Surveillance**

Routine Inspections

The Manager should periodically observe maintenance and servicing activity to help ensure that all required lock-out activities are being performed correctly. All employees should be instructed to inform the Manager or any available supervisor when they feel that there may be a violation of this policy and/or when they feel their safety may be compromised.

Formal Audits

A full audit must be performed at least annually by the Brake Shop Manager to evaluate the effectiveness of the program. This must include observation of a full LOTO operation, from beginning to end, identifying and documenting any problems or deficiencies that may be encountered. An action plan must be developed to address any identified program deficiencies.

**Incident Investigation**

Any accident or near-miss relating to machinery/equipment and/or servicing or maintenance activities will require evaluation of LOTO procedures in addition to the required incident/accident investigation report. If failure of a proper lock-out/tag-out was found to be a contributing factor, then the LOTO program must be re-evaluated and corrective action taken as appropriate.