

BWC

Division of Safety and Hygiene

A SAMPLE LOCKOUT/TAGOUT PROCEDURE

A good Lockout/Tagout Procedure, at a minimum, should contain the following elements:

1. All maintenance personnel shall be provided with a good lock. The lock shall have the individual workers' name and other identification on it. Each worker shall have the only key to the lock.
2. The worker shall check to be sure that no one is operating the machinery BEFORE turning -off the power. The machine operator shall be informed before the power is turned off. Sudden loss of power could cause an accident
3. Steam, air and hydraulic lines shall be bled, drained, and cleaned out. There shall be no pressure in these lines or in reservoir tanks.
4. Any mechanism under tension or pressure, such as springs, shall be released and blocked.
5. Each person who will be working on the machinery shall put a lock on the machine's lockout device(s). Each lock shall remain on the machine until that worker's work is complete.
6. All energy sources that could activate the machine shall be locked out (blocked/tagged).
7. The main valve or main electrical disconnect shall be tested to be sure that the power to the machine is off.
8. Electrical circuits shall be checked with proper and calibrated electrical testing equipment. An electrical failure could energize the equipment even if the switch is in the off position. Stored energy in electrical capacitors shall be safely discharged.
9. When working on machinery such as power presses and welding presses that have a ram that could fall, the ram shall be supported with safety blocks or pins. Fully interlocked safety blocks are the safest.

Sample Program

Hazardous Energy Control Procedures Lockout

I. Purpose and Scope

Effective hazardous energy control procedures will protect employees during machine and equipment servicing and maintenance where the unexpected energization, start up or release of stored energy could occur and cause injury, as well as while working on or near exposed deenergized electrical conductors and parts of electrical equipment. Hazards being guard against include being caught in, being crushed by, being struck by, being thrown from, or contacting live electrical circuits/parts.

The procedure herein established (III - VIII) will insure that machines and equipment are properly isolated from hazardous or potentially hazardous energy sources during servicing and maintenance and properly protect against reenergization as required by 29 CFR 1910.147.

While any employee is exposed to contact with parts of fixed electrical equipment or circuits that have been deenergized, the circuits energizing the parts shall be locked out and tagged in accordance with the requirements of 29 CFR 1910.333 (b) (2). SEE THIS OSHA STANDARD.

Only when disconnecting means or other devices are incapable of being locked out, and until lockout capability is provided, will a tagout procedure (without lockout), be utilized. SEE APPENDIX A.

II. Enforcement

Any employee who fails to follow these procedures will face disciplinary action in accordance with those listed in the company handbook.

III. Definitions

Authorized employee - a person who locks out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance that exposes him/her to potentially hazardous energy.

Affected employee - an employee whose job requires him/her to operate /use a machine or equipment or work in an area in which servicing or maintenance is being performed under lockout.

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 line valve; a block; and any similar device used to block or isolate energy. Push buttons, selectors switches, and other control circuit type devices are not energy isolating devices.

Other employee - an employee whose work operations are or may be in an area where energy control procedures may be utilized.

For additional definitions see 29 CFR 1910.147 (b).

IV. Authorization / Responsibility

Appropriate employees will be instructed in the safety significance of the lockout procedures. Appendix B is a list of employees authorized to lockout. Appendices C and D are a list of job titles for affected and other employees.

V. Rules

A. Locks, chains, wedges, or other hardware which meet the requirements defined in 1910.147 (c) (5) (ii) shall be provided by the company.

B. Lockout devices shall be singularly identified. They shall be the only devices used for controlling energy and shall not be used for other purposes.

C. The lockout devices shall indicate the identity of the employee applying the devices.

D. All machines/equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Lockout will also apply when working on or near exposed deenergized electrical circuits / parts.

E. No employee shall attempt to operate any switch, valve, or other energy -isolating device which is locked out.

F. Each lockout device shall only be removed by the employee who applied the device. (*Exception: see VII. B. 2.*)

VI. Lockout Procedures and Techniques

A. Preparation for Shutdown.

1. In preparation for lockout, an initial survey must be made to locate and identify all energy isolating devices to be certain which switch, valve, or other energy isolating devices apply to the machine / equipment to be locked out. (See Appendix E for Energy Source Evaluation) More than one energy source (electrical, hydraulic, pneumatic, chemical, thermal, or others) may be involved.
2. Before an authorized or affected employee turns off a machine or piece of equipment, the authorized employee must have knowledge of the type and magnitude of the energy to be controlled, and the methods or means to control the energy (see Appendix F for Specific Energy Control Procedures).

Note: If work to be performed involves employees working on or near exposed deenergized electrical parts. (*See 29 CFR 1910.333*).

B. Machine or Equipment Shutdown.

1. All affected employees shall be notified that a lockout system is to be utilized and the reason for it, before the controls are applied.
2. If the machine or equipment is operating, shut it down by normal stopping procedure. (Depress stop button, open toggle switch, etc.)

C. Machine or Equipment Isolation.

Physically locate and operate the switch, valve, or other energy isolating devices so that the equipment is isolated from its energy sources and apply adequate hardware.

D. Lockout Device Application.

1. Authorized employees shall lockout the energy isolating devices with assigned individual locks.
2. Lockout devices shall be applied so that they will hold the energy isolating devices in a "Neutral" or "Off" position.

E. Stored Energy.

All stored or residual energy in rams, flywheels, springs, pneumatic, or hydraulic systems, etc. shall be blocked or dissipated. If there is a possibility of reaccumulation of stored energy, verification of isolation must be continued until servicing or maintenance is completed.

F. Verification of Isolation.

Prior to starting work on machines or equipment that have been locked and after ensuring that no personnel are exposed, the authorized employee shall operate the push button or normal operating controls to verify that the appropriate equipment or machine has been deenergized and make certain it will not operate.

CAUTION: Return Operating Controls to the “Neutral” or “Off” Position after the Test.

The machine / equipment is now locked out. Servicing or maintenance may now occur.

VII. Removal of Lockout Devices

A. After the servicing and / or maintenance is completed and before the lockout devices are removed and energy is restored, the sequence of activities in Appendix F shall be completed by the authorized employee(s).

B. If the authorized employee who applied the lock is not available, the supervisor shall take the following steps:

- * Clear the machine or equipment of tools and materials.
- * Remove employees from the machine or equipment.
- * Remove the lockout device.
- * Energize and proceed with testing or positioning.
- Deenergize all systems and reapply energy control measures in accordance with procedures set forth under SECTION VI.

VIII. Additional Requirements

A. In the proceeding steps, if more than one individual is required to lockout machines / equipment (group lockout), the following procedures shall be implemented to provide protection to all employees.

1. A primary authorized employee will be designated and responsible for the number of people working under the protection of the group lockout device. The primary authorized employee will ascertain the exposure status of the individual member participating in the group lockout to ensure continuity of protection for each individual. In addition, this primary authorized employee will be responsible for notifying affected employees before and after lockout procedures are performed.
2. Each authorized employee will place his/her own personal lockout device on the energy isolating device(s).
3. When an energy- isolating device cannot accept multiple locks, a multiple lockout system must be used.

B. *Shift or Personnel Changes* - If a lockout procedure will extend into the following shift, the authorized employee who originally placed the lock will remove it and it will immediately be replaced with the lock of the authorized employee who is to continue the repair or maintenance on that equipment or machine for the following shift.

C. *Cord and Plug Connected Equipment* - If servicing or maintenance is performed on cord and plug connected equipment the following procedure shall be performed to protect employees.

1. Unplug equipment from its electrical socket.
2. Place a lockable cover over the plug and a lock on the plug cover during machine / equipment servicing or maintenance.

D. *Outside Contractors* - If outside contractors perform servicing or maintenance that requires lockout, the Safety Director shall take the following steps.

1. Inform the outside contractor of our company's lockout procedures and supply them with a copy.
2. Obtain and review a copy of the outside contractor's lockout procedures.
3. Ensure that our employees understand and comply with the responsibilities and prohibitions of the outside contractor's lockout procedure.

E. *Training*

1. Authorized employees shall receive training covering:
 - * Recognition of hazardous energy sources.
 - * Types and magnitude of hazardous energy in the workplace.
 - * Methods, devices, and procedures used to lockout, verify lockout, and otherwise control hazardous energy on all pieces or types of equipment (including cord and plug connected equipment).
 - * Procedures for removing locks and returning a machine or piece of equipment to operation.
 - * Transfer of lockout responsibilities.

- * Group lockout procedures.
2. Affected and all “other” employees shall receive training so that they are able to:
- * Recognize when energy control procedures are being implemented, and
 - * Understanding the purpose of the procedures and the importance of not attempting to start up or use the machine / equipment that has been locked out.

F. Retraining - Authorized and affected employees shall receive retraining in proper application of lockout procedures when there is a change in:

- * Job assignment(s) that expose an authorized employee to new hazards or lockout procedures.
- * Machines, equipment, or processes that present a new hazard or require modified lockout procedures.
- * Energy control procedures for a piece or type of equipment.
- * Or when it becomes known that an employee incorrectly performs lockout procedures.

Retraining will re-establish employee proficiency in lockout, and ensure that employees are knowledgeable of new or revised procedures. All retraining will be certified.

G. Periodic Inspections

1. An inspection of the energy control procedures will be conducted annually and will be certified (see Appendix H).
2. Energy control procedures for each machine or type of machine must be inspected.
3. The inspection shall include a review of lockout responsibilities with each individual authorized to lockout the machine / equipment.
4. The person who performs the inspection must be authorized to perform the lockout procedures being inspected. The inspector cannot, however, review his/her own use of lockout procedures.
5. Any deviations or inadequacies identified shall be immediately addressed.

TAGOUT PROCEDURES

- A. When a disconnecting means or other energy isolating device is incapable of being locked out, a tagout system shall be utilized. A tag used without a lock, shall be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by use of a lock such as opening an additional disconnecting device, removal of an isolating circuit element, blocking of a controlling switch or the removal of a valve handle to reduce the likelihood of inadvertent energization.
- B. Only tags furnished by the company which meet the requirements of 1910.147 (c) (5) (ii) and (iii) shall be used.
- C. All employees shall be trained in the use and limitations of tags as described in 1910.147 (c) (7) (ii) and (d) (4) (iii).
- D. **All** employees must be able to understand the hazard warning written on the tags such as: **DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE, DO NOT OPERATE.**
- E. On machines and equipment where tagout is used in lieu of lockout, the Periodic Inspection required by 1910.147 (c) (6) shall include the affected as well as the authorized employee(s). The periodic inspection shall be certified.
- F. If tagout is used all other lockout rules and procedures apply.

NOTE: Should the machine / equipment require upgrade or modification, it will have lockable switches, fittings, valves, etc. added so that it becomes possible to lockout.

ENERGY SOURCE EVALUATION

DATE: ____/____/____

CONDUCTED BY: _____

In order to determine all energy sources for each piece or type of machine or equipment, fill in the following table.

Location: _____ Work Center: _____

Equipment Name: _____

Model: _____ Serial #: _____

Lockout Procedure Number: _____

ENERGY SOURCE \ * MAGNITUDE	LOCATION OF ISOLATING DEVICE	MEANS OF ISOLATION
ELECTRICAL		
ENGINE		
SPRING		
COUNTER WEIGHT		
FLYWHEEL		
HYDRAULIC		
PNEUMATIC		
CHEMICAL		
THERMAL		
OTHER		

* MAGNITUDE EXAMPLE - Electrical = 480v three phase
Pneumatic = 125 p.s.i.

**SPECIFIC ENERGY CONTROL PROCEDURES
FOR EACH PIECE OR TYPE OF MACHINE OR EQUIPMENT**

PROCEDURE NUMBER: _____

DATE: ____/____/____ **COMPLETED BY:** _____

MACHINES OR EQUIPMENT UTILIZING THIS PROCEDURE:

PROCEDURE FOR CONTROLLING HAZARDOUS ENERGY

1. Be familiar with the sources of hazardous energy for the machine or equipment that will be serviced. **See Appendix F (Energy Source Evaluation)**

SOURCES OF HAZARDOUS ENERGY

- | | | |
|--------------------------------------------|-----------------------------------|------------------------------------|
| <input type="checkbox"/> Electrical | <input type="checkbox"/> Engine | <input type="checkbox"/> Spring |
| <input type="checkbox"/> Counter Weight | <input type="checkbox"/> Flywheel | <input type="checkbox"/> Hydraulic |
| <input type="checkbox"/> Pneumatic | <input type="checkbox"/> Chemical | <input type="checkbox"/> Thermal |
| <input type="checkbox"/> Other _____ | | |

2. Notify affected employees that the machine is about to be shut down and locked out.

Specific Instructions:

3. Shut down the machine using normal stopping procedures.

Specific Instructions:

4. Isolate all energy sources listed above.

Specific Instructions:

5.A. Apply locks to all isolation devices operated in step four.

Specific Instructions:

B. If a tag is used in lieu of a lock when the energy- isolating device is incapable of lockout (see Appendix A), the following additional safety precaution(s) shall be taken:

6. Block or dissipate all stored energy in rams, flywheels, springs, pneumatic or hydraulic systems, etc.

Specific Instructions:

7. Verify that the machine is locked out by testing the machine operating controls. **RETURN ALL CONTROLS TO THE "NEUTRAL" OR "OFF" POSITION AFTER TESTING.**

Specific Instructions:

PROCEDURES FOR REMOVING LOCKS / TAGS

1. Check the machine to be sure it is operationally intact, tools have been removed, and guards have been replaced.

Specific Instructions:

2. Check to be sure all employees are safely positioned.

Specific Instructions:

3. Notify all affected employees that locks / tags are going to be removed and the machine is ready for operation.

Specific Instructions:

4. Remove all locks, blocks, or other energy restraints.

Specific Instructions:

5. Restore all energy to the machine.

Specific Instructions:

OTHER COMMENTS:

Periodic Inspection Certification

DATE OF INSPECTION: ____/____/____

INSPECTOR: _____

SIGNATURE: _____

Machine or equipment on which lockout / tagout procedures were performed:

Employee(s) performing the lockout / tagout procedures:

Employee Name (Please Print)

Employee Signature

_____	_____
_____	_____
_____	_____
_____	_____

Were all the lockout / tagout procedures performed correctly? YES NO

Comments on improper lockout / tagout procedures being used (ex. list improper procedures being used that require retraining for the employee or modification of procedures):

HAZARDOUS ENERGY CONTROL PROCEDURES

Name of employee exposed to the hazard: _____

Machine / Equipment on which the task is being performed:

Servicing / Maintenance task being performed:

Frequency in which the employee performs the task: _____ times per _____

Duration for which the employee has performed the task: _____ hour/day/week

Hazard to which the employee is exposed when performing this task:

_____ caught in _____

_____ crushed by _____

_____ struck by _____

_____ thrown from _____

_____ contact with _____

_____ other _____

Energy source which exposes the employee to a hazard:

- | | | | |
|----------------|-----------------|---------------|--------------------|
| ___ Electrical | ___ Engine | ___ Spring | ___ Counter Weight |
| ___ Flywheel | ___ Hydraulic | ___ Pneumatic | ___ Chemical |
| ___ Thermal | ___ Other _____ | | |

Magnitude of the energy source:

___ Volts ___ Phase ___ PSI ___ Degree F ___ Tons

Potential Injury associated with the improper isolation of energy:

Crushed _____ Fractured _____

Amputated _____ Lacerated _____

Punctured _____ Burns _____

___ Air Embolism ___ Death ___ Electric Shock

Other _____

Means of Isolating the Energy Source (Procedures Used)

[If tagout is used see 1910.147 (c) (3) (ii)]

Location: _____ Method: _____

If machine / equipment is not capable of lockout when was it installed, renovated, modified, or repaired (major)? After 1/02/90 ____/____/____

If Electrical, cord / plug (circle one); YES NO

Hazards discussed with exposed employee Mr. / Ms. _____

Remarks/Signed Statement (if documenting past exposure)

Hazard reviewed with employer Mr. / Ms. _____

Remarks: _____

**THE CONTROL OF HAZARDOUS ENERGY
(LOCKOUT / TAGOUT) 1910.147
WRITTEN PROCEDURES EVALUATION**

YES

NO

Do the written procedures contain the following elements:

- | | | |
|-----|-----|----------------------------------------------------------------------------|
| ___ | ___ | A definition of the purpose and scope of lockout and/or tagout procedures. |
| ___ | ___ | Basic lockout / tagout rules and authorization. |
| ___ | ___ | Means of enforcing compliance. |

Specific procedures for:

- | | | |
|-----|-----|-------------------------------------------------------------------------------------------------|
| ___ | ___ | Shutting down machines and/or equipment. |
| ___ | ___ | Isolating, blocking, and securing machines and/or equipment. |
| ___ | ___ | Placement of lockout / tagout devices. |
| ___ | ___ | Releasing stored energy. |
| ___ | ___ | Testing a machine and/or equipment to verify the effectiveness of the lockout / tagout devices. |
| ___ | ___ | Removal of lockout / tagout devices. |
| ___ | ___ | Transfer of lockout/tagout devices during group lockout/tagout [If Applicable]. |
| ___ | ___ | Responsibility for lockout/tagout devices during group lockout/tagout [If Applicable]. |
| ___ | ___ | Group Lockout/Tagout [If Applicable]. |
| ___ | ___ | Additional measures taken if a tag is used in lieu of a lock. |

The employer must comply with the following items, however they do not have to be included in the written procedures:

- | | | |
|-----|-----|---------------------------------------------------------------------------------------------------------------------------------|
| ___ | ___ | Provide energy control devices that meet the requirements defined in 1910.147 (c) (5). |
| ___ | ___ | Inform outside contractors of your lockout/tagout program and notify your employees of the contractor's energy control program. |
| ___ | ___ | Certification of a periodic inspection conducted at least annually. |
| ___ | ___ | Certification of training and retraining for authorized, affected, and other employees. |
| ___ | ___ | Handling cord and plug connected equipment 1910.147 (a)(2)(iii) (A). |