LOCK &TAGOUT

(Insert location name here.)

Subject: Control of Hazardous Energy-Lockout and Tagout
Effective date:
Last Revision:
(Include list of last revisions in appendix.)

1. PURPOSE

This procedure follows the requirements set by OSHA 1910.147—The Control of Hazardous Energy (Lockout and tagout). It is to be used to ensure that all equipment is isolated from all potentially hazardous energy sources, and locked and tagged out before employees do any servicing or maintenance activities where the unexpected energization, start-up or release of stored energy could cause injury. All employees of (**Insert Company Name**) and outside personnel, who are performing work at (**Insert Company Name**) are required to follow this procedure.

2. SCOPE

This section applies to the control of energy during servicing and/or maintenance of machines and equipment. Servicing and/or maintenance which takes place during normal production operations are covered by this section only 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.

Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, may not be covered by this section if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection.

AT NO TIME MAY ANY EMPLOYEE REACH INTO IDENTIFIED PINCH POINTS WHILE EQUIPMENT IS IN OPERATION.

If an employee is required to remove or bypass a guard or other safety device, or to place any part of his/her body into the mechanism of a piece of equipment, lockout and tagout is required.

3. DEFINITIONS

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

Authorized employee: A person who locks out or tags 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 covered in this section.

Capable of being locked out: An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized: Connected to an energy source or containing residual or stored energy.

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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, selector switches and other control circuit type devices are not energy isolating devices.

Energy source: Any source of electrical, mechanical, hydraulic, pneumatic, chemical, gravity, spring loaded device, thermal, or other energy.

Full employee protection: When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and the location shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

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.

Lockout device: A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations: The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting up: Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout: The placement of a tagout device 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.

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.

4. RESPONSIBILITIES

PLANT MANAGEMENT

It is management's responsibility to determine which specific applications require the use of a lockout and tagout program. Management must provide the proper equipment, including new and/or refurbished machines to meet the needs of each specific application.

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SUPERVISORS

It shall be the responsibility of all supervisors of employees performing such operation to:

1. Instruct their employees as to the content of this program.
2. Make copies of this procedure readily available to all employees.
3. Periodically audit the procedure to ensure compliance with this procedure.
4. Ensure the proper posting of machine specific lockout and tagout instructions.
5. Enforce this policy and utilize disciplinary actions if these procedures are not followed.

Employees

It shall be the responsibility of all employees of (**Insert Company Name**) to:

1. Be aware of the Hazardous Energy Control Procedures of (**Insert Company Name**)
2. Follow all procedures related to control of hazardous energy.
3. Remind and encourage co-workers to follow lockout and tagout procedures.

Safety Coordinator

Ensure that the lockout and tagout process is implemented and followed at the facility. Ensure that the process is reviewed annually and updated as needed.

Plant Engineering or Maintenance Manager

The Engineering or Maintenance manager is responsible for developing the equipment specific lockout procedures and conducting the annual verification of the process.

Contractors and outside personnel:

All contractors or other outside personnel working on or around energized equipment must follow the plant Lockout and tagout procedures at all times. ***No exceptions.***

5. PROGRAM ELEMENTS

5.1 Energy Control Procedures

(**Insert Company Name**) has established a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

5.2 Application of Control Devices

Protective materials and hardware such as locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the location for isolating, securing or blocking of machines or equipment from energy sources.

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Lockout devices and tagout devices shall be singularly identified; shall be the only devices(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

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

Lockout and tagout devices are arranged 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.

Lockout devices are sturdy 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.

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 the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

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

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 Close, Do Not Energize, and Do Not Operate**.

If an energy-isolating device is not capable of being locked out, the energy control program shall utilize a tagout system.

If an energy-isolating device is capable of being locked out, the energy control program will utilize lockout.

5.3 Release From Lockout and tagout

Before removing lockout or tagout devices, inspect the work area to ensure that all non-essential items have been removed and that all equipment is operationally intact. Ensure all employees have been notified that the lockout devices are being removed and that they are “clear” of the equipment. Verify the controls are in neutral. Then remove the lockout and tags from the equipment. All safety systems shall be in normal operational sate prior to giving control back to operators. Notify employees that machine is back in service. Operators should always verify operation of safety systems and equipment before resuming operation.

5.4 Group Lockout and tagout

On machines or equipment where a group of employees are involved in maintenance, service, cleaning or modification, lockout and tagout procedures shall be performed according to the following requirements:

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- One employee (preferably department Supervisor) must take primary responsibility for a set number of employees working under the protection of a group lockout and tagout device.
- Each employee involved must place a personal lockout and tagout device to the group lockout device or any other mechanism when they begin work.

Each individual employee has a responsibility to remove their own lock/tag after they are no longer working on the machine/equipment. Under no circumstances will any employee remove the lock or tag of another employee.

5.5 Shift or Personnel Changes

Each employee is responsible for removing their lock and tag when their work is completed or at a change of shift.

- When a shift change occurs, the employee going off the shift must not remove his/her lock and tag until the oncoming employee has installed his/her lock and tag.

5.6 Training/Communication

- New employees will be trained during orientation using available audio/visual presentations.
- Each *affected and authorized employee* will be retrained annually using available audio/visual presentations. Authorized employees will be tested on their lockout and tagout knowledge to ensure proper understanding.
- Documentation of employee training will be kept on file by their respective supervisor and the Health/Safety Coordinator.
- All transfer and new hires will have department specific training.
- Employees must be retrained when there is a change in job assignment or change in process or whenever there is evidence that indicates deviations from inadequacies in the employees' knowledge or use of lockout and tagout procedures.

5.7 Periodic Inspections

This plant will conduct an inspection of the Hazardous Energy Control Procedures (Written Lockout and tagout procedures) annually. The Engineering Manager is responsible for the completion of the inspection. They may involve others in the process as needed. The inspection is designed to ensure that the program is functioning properly and to ensure the knowledge and skill of the employees involved.

This will be documented on the Lockout and tagout form and signed by the individual(s) conducting the inspection and the individual performing the Lockout and tagout procedures. These sheets will be kept in the Safety Office.

The Documentation of the inspection will identify:

1) Date of the inspection.
2) Name of individual conducting the inspection (must be an authorized LO and TO employee).
3) Name of individual performing the LO and TO procedures (must be different from the person conducting the inspection).

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4) The identification of the piece of equipment.
5) Verification that the procedure is appropriate to isolate all energy sources.
6) Recommendations and follow up to ensure that any modifications to the process are implemented and known by all affected employees.

5.9 Outside Contractors

When contractors or other outside workers are performing service or maintenance at (**Insert Company Name**), they will:

1) Follow (**Insert Company Name**), lockout and tagout system.
2) Be alert for new types of lockout or tagout devices.
3) Company representative working with contractors will ensure that affected (**Insert Company Name**) employees are informed the contractors are working in their area and that the contractor is informed of (**Insert Company Name**) procedures.

5.10 Testing and Positioning

In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized in order to test or position the machine, the following steps must be taken:

1) Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
2) Check the work area to ensure that all employees have been safely positioned or removed from the area. Maintain this control throughout the procedure.
3) Verify that the controls are in a safe state which is likely neutral.
4) Remove the lockout devices, reenergize the machine or equipment, and proceed with testing or positioning.
5) De-energize all systems and lock out the energy isolating device(s) with assigned individual lock(s). Be sure lock is tagged with operator and date.
6) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s), or by testing to make certain the equipment will not operate. CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.
7) The machine or equipment is now locked out, and servicing or maintenance can continue.

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6. ENERGY SOURCES

All equipment is identified and procedures are in place to control energy sources identified on the equipment. The following is information regarding energy sources and controls:

Hazardous energy sources associated with machinery are:

- Electrical
- Pneumatic
- Hydraulic
- Fluids and Gases
- Mechanical

6.1 The following methods and devices can be used to lockout and tagout the above energy sources.

1) Electrical
   a. Unplug machine and use an electrical plug lockout or use a disconnect switch with padlocks, lockouts, and tags.
   b. Ensure that all power sources are locked and tagged out.
   c. Stored electrical energy must be bled to obtain zero energy state.
   d. Use a tester to ensure that all circuits are dead.
2) Pneumatic
   a. Release pressure to reach zero energy state.
   b. Use chains, energy isolation air valves, shut off valves, padlocks, blinds, slip-blinds, and lockouts to lockout the energy source.
3) Hydraulic
   a. Release pressure to reach zero energy state
   b. Use lockout valves, chains, padlocks, blinds, slip-blinds and lockouts to lockout energy source
4) Fluids and Gases
   a. Use lockout valves, chains, padlocks, blinds, slip-blinds and lockouts to lockout energy source.
   b. Consider type of gas and whether it can be vented. Is it explosive? Is it an asphyxiant? Can it be vented to building? Can it be vented to system downstream? Can it be vented to atmosphere? Can it be burned off? Do not simply release without consideration of process.
   c. Consider use of double blocking when methods for shut-off may fail. For instance a valve may leak imperceptibly which may be ok for some gases but not for explosive or asphyxiant gases. Double blocking uses two valves or a valve and a block to separate dangerous or high pressure gases from where work is performed.
   d. Beware of release of mechanical weight creating hydraulic pressure in a cylinder or system when other parts or release.
5) Mechanical

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e. Release all stored mechanical energy or block the energy. Be aware of gravity, springs, tension, and other sources of energy that are not always obvious.
f. Use mechanical blocks to restrain energy. Make sure they are properly sized for job.
g. Padlocks, lockouts, and tags should also be used to lockout and tagout mechanical energy.

7. SERVICING AND MAINTENANCE-ROUTINE ADJUSTMENTS

Maintenance may need to "jog" a machine for timing purposes are allowed to do so only under safe conditions when it is known that all associates/tools are away from moving parts and any danger of injury or damage are considered and mitigated. All Lockout and tagout rules apply for this type of work.

ROUTINE ADJUSTMENTS

Maintenance or production associates expected to make routine/minor adjustments are only allowed to do so providing all immediate danger and energy sources are identified and controlled or the adjustment point is nowhere near an energy source for the person performing the work or someone working nearby. (If the adjustment cannot be made without verifying the control of the energy source, or the adjustment is made in an area where the energy source could create the potential for injury, a total LOTO must be performed prior to the adjustment.)

PRODUCTION ADJUSTMENTS

Adjustment for production purposes must be done with respect to assessing the risk and applying the LOTO principles as defined under Routine Adjustments section found in the previous paragraph.

8. IDENTIFICATION

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

9. REMOVAL OF ABANDONED LOCK

When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the facility management. Location management shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it.

The procedure includes at least the following elements:

1. Verification by the location management that the authorized employee who applied the device is not at the facility;
2. Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and
3. Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

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10. APPLICATION OF CONTROL

Lockout and tagout procedures must be performed in the following order:

10.1 Preparation for shutdown.

Before a machine or a piece of equipment is turned off, the employee performing the lockout and tagout must have the knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the methods or means to control the energy to be encountered.

10.2 Machine or equipment shutdown

The machine or equipment must be shut down in as orderly fashion as possible in order to avoid any additional or increased hazard to employees as a result of de-energization.

The initiating employee inspects the work area to ensure that all non-essential items have been removed and to insure that machine or equipment components are operationally intact.

Ensure all employees have been safely positioned or removed from the scene

Notify all that were informed at the beginning of the lockout and tagout procedure that the locks and tags are to be removed, and the equipment will be re-energized

10.3 Machine or equipment isolation

All energy isolating devices that are needed to control the energy to the machine or equipment must be located and operated in such a manner as to isolate the machine or equipment from all energy sources.

10.4 Lockout and tagout device application

A lockout and tagout device must be affixed to each energy isolating device by the persons performing the lockout and tagout. These must be placed in a manner so they will hold the energy isolating device in a de-energized position. Each LOTO device/tag is labeled with the name of the associate written on the tag. Associates in the plant do not have their own LOTO device. Rather, the tag informs all associates who is responsible for the LOTO.

During the course of a LOTO procedure, it is critical to determine who is going to apply the LOTO device or will be the user.

Tags clearly indicate that the operation or movement of energy isolating devices from the de-energized position is prohibited. The tag must be attached when the piece of equipment is de-energized.

Tags are affixed directly to the lock in such a way they cannot be removed without cutting (cable tie) or removing the lock. In addition, the tag is filled out each time it is used (these are reusable tags, just write on them with an erasable marker and wipe off after each use) with date, equipment locked out and name of person performing the LOTO procedure.

The key for each lock is kept in the possession of the person performing the LOTO task until he/she removes the lock.

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10.5 Stored Energy Isolation

Following the application of lockout and tagout devices to energy isolating devices, all potentially hazardous stored or residual energy is released, disconnected, restrained, or otherwise made safe. If there is a danger that stored energy will re-accumulate to a hazardous level, isolation must continue to be verified until the servicing or maintenance is completed or until the possibility of such accumulation no longer exists.

10.6 Verification of Isolation

Before starting work on a machine or equipment, the employee must verify that the isolation and de-energizing of the machine or equipment has been effective.

This is done by trying to activate the energy source. If the machine does not activate, the operator may proceed. For some work where the presence of electric, hydraulic, pneumatic or other energy source may be worked on directly it may also be necessary to check voltage, pressure or other with an appropriate testing device at an appropriate testing location with appropriate PPE for the task. Also, for instance in the case of electrical it may also be necessary to insure that electric voltage is not for instance on the ground prior to work. When energy sources are shown to be zero or the expected state work may commence.

10.7 Release from Lockout and tagout

Before removing lockout and tagout devices, the following must be done:

- The initiating employee inspects the work area to ensure that all non-essential items have been removed from around the machine and ensure that the machine or equipment components are operationally intact
- Make sure all employees have been safely positioned or removed from the scene. Maintain this span of control during operations. If it is lost re-check and re-establish. Do not assume everyone is in a safe location.
- Notify all employees that were informed at the beginning of the lockout and tagout procedure that the locks and tags are to be removed, and the equipment will be re-energized.

HAZARDOUS ENERGY IDENTIFICATION FORM

Equipment ID #	Process/Equipment	**Hazardous Energy Source** (Identify ALL energy sources on the process- electricity, pressure, gravity, mechanical, etc.)	**Location of Energy Source** (Master Control Room #2 on electrical panel 2, valves, disconnects, etc.)

MACHINE SPECIFIC LOCKOUT AND TAGOUT PROCEDURES

Process/Equipment:		
Equipment ID #:	**Date:**	
Energy Sources:		
Location of Energy Sources:		
Authorized Employees: (Individuals who received training on equipment and lockout procedures)		
Shut Down Procedures: (How to turn off all equipment)		
Machine/Equipment Isolation: (Energy sources shut off—dissipated to isolate the source)		
Apply Lockout /Tagout Devices: (Affixed to ensure the energy source will not be activated)		
Verification of Isolation: (Try to start the machine to ensure all energy sources are identified and properly locked out.)		
Perform Work:		
Removal of Lockout and Tagout Devices: (Make sure all tools are removed from the work area and all guards place back on equipment prior to re-starting equipment)		
Restore Energy: (Advise all affected employees that machine will be restarted)		
Verification by:		