Environmental Health and Safety

Control of Hazardous Energy Program: Lockout/tagout/verify

Contents

Purpose

The Control of Hazardous Energy Program's purpose is to protect employees from the unexpected release of hazardous energy during maintenance, servicing or repair of machinery or equipment. The program is designed to ensure that machinery is properly de-energized, locked out and tagged before any work begins, preventing the inadvertent startup of machinery or equipment that could lead to serious injuries or fatalities. This program minimizes accident risks caused by the unexpected energization of energy sources by implementing comprehensive procedures and training, including:

- Chemicals and gases.
- Electrical.
- Hydraulic and pneumatic.
- Mechanical.
- Stored gravitation energy.
- Thermal.

The ASU Control of Hazardous Energy Program ensures energy hazard identification and evaluation that employees could be exposed to and provides specific training required by the Occupation Safety and Health Administration, OSHA Standard 29 CFR 1910.147, The Control of Hazardous Energy, lockout/tagout and EHS 117: Lockout/Tagout.

Scope and applicability

The ASU Control of Hazardous Energy Program applies to all departments on ASU campuses, off-campus ASU work locations and leased properties where any work could result in an incident caused by hazardous energy. All ASU employees engaged in work-related activities must follow the requirements outlined in this program where there is an incident risk caused by hazardous energy.

Roles and responsibilities

Environmental Health and Safety

ASU is classified as a non-manufacturing employer where a select number of employees are exposed to hazardous conditions during their employment. It is EHS's responsibility to develop, maintain and implement occupational health and safety programs.
EHS responsibilities include:

- Investigate and document all incidents that result in employee injury or property damage.
- Maintain employee training records.
- Periodically audit the compliance with this program and notify affected management of any findings or opportunities for improvement related to this program.
- Providing training to ASU employees and evaluate Lockout/tagout, or LOTO, procedures and forms as requested.

EHS has the final authority over safety issues and may halt operations or practices that pose an imminent danger at any time.

Capital Projects Management Group

The Capital Projects Management Group, or CPMG, is responsible for ensuring that:

- All general contractors are notified that they are responsible for ensuring compliance with all applicable federal, OSHA, state and local regulations related to the control of hazardous energy.

Facilities Development and Management

ASU Facilities Development and Management or FDM, is responsible for:

- Completing energy control procedure, or ECP, documentation as required.
- Developing and implementing a system to ensure proper LOTO procedures are followed.
- Providing employees with proper PPE and LOTO equipment.
- Verifying periodic inspections occur at least annually.
- Verifying employees have completed the Control of Hazardous Energy training.

Employees

ASU employees are responsible for:

- Adhering to specifications for the safe operation and maintenance of equipment.
- Completing the Control of Hazardous Energy training.
- Completing the periodic inspection form at least annually.
- Immediately reporting damaged or defective locks, tags or locking mechanisms.
- Following all LOTO procedures, including abandoned lock removal.
- Utilizing and maintaining proper PPE.

LOTO system basic rules

All equipment undergoing maintenance, service or adjustment shall be locked out and tagged out before work is performed on the equipment or system. This ensures protection against accidental or inadvertent operation causing employee injury.

Do not attempt to operate, adjust or work on any switch, valve or other energy-storing device or system unless it is locked and tagged out and has been verified as a “zero” state. This includes all energy sources if a system or piece of equipment has more than one. Any contractors or persons required to operate equipment at ASU must verify all existing field conditions before operating any equipment for themselves.

Electrical energy sources will be removed or controlled by an electrician at the request of other units. Only electricians trained and qualified to operate the ASU electrical primary distribution systems are authorized to perform LOTO on primary power sources.

Procedures

Steps to control hazardous energy

The following are the LOTO process basic steps to prepare equipment for safe servicing and maintenance work.

1. Prepare: Identify energy sources and energy-isolating devices.
2. Notify affected employees the machine or equipment is to be shut down and locked out.
3. Shut down: De-energize the equipment by using a power switch, unplugging or disconnecting.

4. Isolate: Secure energy-isolation devices on the equipment in a safe position. Release or restrain potential energy that cannot be isolated.
5. Place a lock and tag: Use lockout devices to secure the energy-isolating device and the tag to identify personnel locking the device out.
6. Dissipate or restrain stored or residual energy: Use methods such as grounding, repositioning, blocking or bleeding down.
7. Verify: Test equipment power to verify that all power sources are de-energized. This can be completed by attempting to power-on the equipment or testing its functionality.

LOTO preparation

A survey must be conducted to locate and identify all energy sources needing LOTO. Dual or redundant controls must be identified and all energy sources secured, blocked, wedged or otherwise restrained in a safe state. An energy control procedure must be reviewed and followed, if available.

Develop a plan if one is not available using the template provided in Appendix B. Follow the plan during the LOTO activity and submit it to the shop supervisor after the LOTO activity, including:

1. All sources of hazardous energy must be identified before work commences. This allows the employee to properly assess and acquire the proper lockout and securing devices to ensure their safety.

2. A tagout schedule must be developed for each piece of equipment and machinery and kept on file for future reference or use. This schedule describes:

    - Disconnect type means.
    - Energy sources.
    - Location.

3. Locks and tags are used to lock out electrical switches, breakers and disconnect means provided for that purpose. Securing or locking out other equipment using chains or other safety support devices may be required. Tags must be used with locks.

4. A shutdown procedure will be written in advance and approved by an Electrical Services supervisor before shutting down any primary electrical equipment.

Note: Proper PPE and clothing must be worn and the ASU Electrical Safety Program followed for all energized circuits 50 volts and above. Only employees considered qualified under the ASU Electrical Safety Program may disconnect power sources over 220 volts between phases or above.

“Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.
Exception: The employer need not document the required procedure for a particular machine or equipment when all of the following elements exist:

1. The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees;
2. The machine or equipment has a single energy source which can be readily identified and isolated;
3. The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment;
4. The machines or equipment is isolated from that energy source and locked out during servicing or maintenance;
5. A single lockout device will achieve a lock-out condition;

6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
7. The servicing or maintenance does not create hazards for other employees.
8. The employer, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance." OSHA 1910.147(c)(4).

A qualified employee may develop an energy control procedure when required using the template in Appendix B of this procedure. Each developed energy control procedure shall be submitted to the employee's supervisor and maintained in each department for future reference.

Employee safety lockout

All personal safety locks have only one key for the lock and are issued to the employee by their supervisor. Multiple issued locks may be keyed to the same key for the assigned employee but may not be keyed the same between employees or groups. A personal safety lock and tag will be attached to the equipment disconnecting means when a piece of equipment is locked out.

Personal safety locks are provided or made available by the employee's supervisor. All lockout tags, multiple hasp and clamshell locking devices are stocked in the FDM Maintenance Stores Warehouse.

- **Personal safety locks**: ASU-approved steel locks shall be used for LOTO. Locks must be **yellow** in color as approved by ASU EHS and FDM: Master Lock model #6835 or American Lock model AMAA1105KD YLW.

Personal safety locks have only one key for the lock and are issued to employees by their supervisor. Each assigned lock shall include at a minimum:

- Employee name.
- ASU Facilities Development and Management Service Center phone number or the employee department's phone number for Non-Facilities Development and Management employees.

Multiple issued locks may be keyed to the same key for the assigned employee, but not the same key between employees or groups:

- Personal safety locks and tag-out devices must be used by all employees who work on, adjust, repair or replace equipment that has energy-storing potential.

- Requesting units, must each install their own personal safety lock on a piece of equipment or system. Multiple lock hasps or gang hasps are used when more than one individual works on the equipment or system.

"Lockout devices shall be substantial 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." OSHA 1910.147(c)

Machine and equipment control: Equipment or "out of service/custodial" lock

All energy control devices needed to control the energy to the machine or equipment will be physically located and secured in such a manner as to isolate the machine or equipment from all energy sources. All equipment to be serviced, worked on or adjusted shall be locked out with a personal safety lock and tag before work is performed on the equipment or system to ensure protection against accidental or inadvertent operation that could cause injury to personnel.

The personal safety LOTO must be removed and replaced with a lock for securing equipment should the shift change before the machinery or equipment can be restored to service, or if the employee leaves the area for a substantial length of time. Employees must employ their lock for personal safety and tag before the previous shift may remove their personal safety lock and tag or equipment lock if the task is reassigned to the next shift and if applicable.

- **Locks for Securing Equipment**: American Standard 1105, key cylinder #63485 should be used for equipment identified as “Out of Service” or “Custodial locks” and shall be **red** in color.

Tags

Tags are not required for locks securing equipment from unauthorized entry, i.e., custodial locks. Employees and contractors with questions related to general equipment locks should contact the ASU Facilities Management Service Center.

Note: ASU utilizes the lock and tag system. Using a tag only is prohibited at ASU.

Each employee shall be issued a set of safety LOTO locks and tags.

Tags must include the words **Danger**: Do Not Start, Do not open, Do not close, Do not Energize, Do not Operate or similar phrasing. Tags must include the following at a minimum:

- Employee name.
- Employee photo.
- The ASU Facilities Development and Management Service Center phone number or employee department’s phone number for Non-Facilities Development and Management employees.

“Tagout device: 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.” OSHA 1910.147(c)

Stored energy

Perform the following steps when working with stored energy:

1. Relieve, disconnect, restrain and otherwise render safe all potential or residual energy by following the LOTO application to the energy-isolating devices.
2. Continue isolation verification until the maintenance or servicing is complete if the re-accumulation of stored energy to a hazardous energy level is possible.
3. Release stored energy, e.g. capacitors, springs, elevated members, rotating flywheels and hydraulic, air, gas or steam systems, must be relieved or restrained by blocking, bleeding the system, grounding or repositioning.

Isolation verification

Perform the following steps to verify the energy has been isolated:

1. Authorized employees verify that isolation or de-energization of the machine or equipment has been accomplished before starting work on machines or equipment that have been locked and tagged out.

2. Test all lock and tag outs by following the normal start-up procedures of the equipment, e.g. depress the start button, etc., after assuring that no employee will be placed in danger.

   Caution: Place the controls in a neutral position after the test.

LOTO release

Take the following actions before LOTO devices are removed and the energy is restored to the machine or equipment:

1. Thoroughly inspect the work. Ensure that nonessential items have been removed and the machine or equipment components are operational.
2. Check the work to ensure all employees have been safely positioned or removed. Notify the affected employees that the LOTO devices are being removed before removal.
3. The employee, who applied the LOTO device, will remove it from each energy-isolating device after replacing the guards.

LOTO procedure for electrical plug-type equipment

This procedure covers all electrical plug-type equipment, including:

- Batteries.
- Chargers.
- Fans.
- Lathes.
- Powered bench tools.
- Powered hand tools.
- Product pumps.
- Office equipment.

Utilize the following procedures to prevent accidental or sudden startup when working on, repairing or adjusting the above equipment:

1. Unplug electrical equipment from the wall socket or in-line socket.
2. Attach a "Do Not Operate" tag, plug box and lock on the end of power cords. **Exception**: LOTO is not required if the cord and plug remain in the employee's exclusive control while working on, adjusting or inspecting the equipment.
3. Test the equipment to ensure the power source has been removed by depressing the "Start" or "On" Switch.
4. Perform the required operations.
5. Replace all the guards previously removed.
6. Remove the lock, plug box and tag.
7. Inspect the power cord and socket before plugging in the equipment. Any defects must be repaired before placing the equipment back in service.

LOTO procedures involving more than one employee

Each employee must place their own lock and tag on the energy isolating device if more than one employee is assigned to a task requiring LOTO.

The first employee applying the LOTO on the equipment or system uses a group hasp to accommodate multiple individual locks and tags. Individual tags must be placed with the individual's lock to ensure consistency and traceability.

The general equipment unit locks are used by the assigned unit when a piece of equipment is to remain locked out at the end of the shift or when locked out for “out of service” purposes. The lock for securing equipment will be removed and a personal safety lock and tag will be used to protect the equipment and employees when it is known that another employee in the unit may finish the job, i.e., replace motor or other electrical devices at a later date.

Multiple locking devices are used if the primary locking device will not accommodate each employee’s lock. The shank of the multiple device must immobilize the equipment and not merely attach to the shank of another lock when multiple locking devices are required.

1. The employee makes certain the equipment is immobilized by pushing the start button in the field before work commences. The test will only be performed after the entire area has been inspected and each employee has been advised.

2. All doubts will be removed before starting the job by asking a supervisor for assistance or clarification if an employee has any doubt about the location of lockout switches, lockout procedures, job procedures or any other questions about their particular job assignment.

3. One employee will be designated or assigned to operate the equipment whenever it becomes necessary to operate or test the equipment during the work assignment. The assigned employee will operate the equipment only after:

    a. Each employee removes their lock and tag.
    b. The entire area has been inspected to ensure that each employee has been advised of the intent to operate.
    c. The employee has ensured everyone is in the clear.

4. Each employee who continues to work on the equipment will replace their lock and tag on the lockout device after the test is performed. An equipment retest will be conducted to ensure no energy source is present and everyone is clear of danger before proceeding to work on the equipment.

5. All work performed on the equipment is accomplished in a safe and prescribed orderly manner ensuring a “zero” state.

6. Tags **must** be used in addition to the locks and **may not be** substituted for the lock. Each unit involved in the repair or maintenance of a particular piece of equipment or system provides their own personal lock and tag.

7. The employee removes their personal lock and replaces it with a lock for securing equipment before leaving the job for another assignment at the end of a shift or upon completion of the job. The employee will notify their supervisor when the job is not complete. The supervisor or subsequent employee only removes the lock after all work has been completed, all guards have been replaced, and no hazardous operating or working conditions are left.

8. All tags and locks are removed when the employee completes the work. The last employee in each assigned unit removes the unit tag. The equipment or system may be placed back into service only after the locks and tags have been removed, the area inspected for hazards, and assuring that all employees are clear.

9. The employee's supervisor may remove the lock and tag if an employee leaves the facility before removing their lock and tag and if the abandoned lock procedure process is followed and the Abandoned Lock Removal form in Appendix D is completed.

10. Each employee is assigned a key to their personal safety lock. A duplicated key cannot be made, given to a second party or left for others to use.

Extended LOTO

The individual LOTO must be removed and replaced with an equipment lock and “Out of service” tag if the shift changes before the machinery or equipment can be restored to service. Employees must employ their individual lock and tag before the previous shift may remove their lock and tag or equipment lock if the task is reassigned to the next shift, if applicable.

Abandoned lock and tag removal process

Only the Employee who locks and tags out machinery, equipment or processes may remove their lock and tag. However, should the employee leave the facility before removing their lock and tag, the employee supervisor may remove the lock and tag if the abandoned lock procedure process is followed and the Abandoned Lock Removal form in Appendix D is completed.

Contractors

Contractors working on ASU property and equipment must comply with LOTO and energy control procedures while servicing, maintaining or installing equipment, machinery or processes as prescribed under 29 CFR 1910.147. Contractors are responsible for developing their own LOTO procedures and training employees under their supervision. ASU employees and contractors working in the same location must adhere to their respective LOTO procedures and inform each other of the specific procedures followed while working in the same location. The ASU program must be followed by all parties during a machine or equipment control “out of service” situation.

Routine maintenance

In rare instances where equipment must be energized to allow for proper adjustment or maintenance, LOTO procedures are not required. This rare exception may only be used by trained and authorized employees and specific procedures have been developed to safely avoid hazards. These activities are to be identified in the energy control procedure if applicable. All considerations shall be made preventing the need for an employee to break the plane of a normally guarded equipment area by use of tools and other devices.

Note: Working on equipment that is energized is not recommended and should be planned in advance.

Annual inspection program

ASU conducts an annual inspection of the Energy Control Procedure, or ECP, ensuring that this standard’s procedure and requirements are followed.

The Annual inspection is performed by an authorized employee other than the ones utilizing the energy control procedure being inspected by Facilities Development and Management or other LOTO users.

The annual inspection is conducted to correct any deviations or inadequacies identified.

The ECP annual inspection includes a review between the inspector and each authorized employee of their responsibilities under the energy control procedure being inspected.

The annual inspection shall include a review, between the inspector and each authorized and affected employee of that employee's responsibilities under the energy control procedure being inspected, and the elements outlined in OSHA 1910.147)(7)(ii) when tagout is used for energy control.

ASU EHS certifies the inspection is performed annually. The certification identifies:

- Date of the inspection.
- Employees included in the inspection.
- Machine or equipment that the energy control procedure is being utilized.
- The person performing the inspection.

The authorized employee also performs and completes the Annual Review found in Appendix C with the appropriate shop supervisor.

Training

All authorized employees are provided Control of Hazardous Energy Program training on procedures and all applicable standards of OSHA1910.147.

ASU provides training ensuring the purpose and function of the energy control program are understood by employees and the knowledge and skills required for the safe application, usage and removal of the energy controls are acquired by employees.

New employees must be trained in LOTO before conducting work subject to the LOTO program. Training is required even if the employee received training from a previous employer. All authorized employees are retrained at least annually. Training records are the responsibility of EHS and Human Resources.

Retraining is provided for all authorized and affected employees whenever there is a:

- Change in the machines, equipment or processes that present a new hazard.
- Change in the energy control procedures.
- Change in their job assignment.

Additional retraining is also conducted when the employer believes there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

The retraining reestablishes employee proficiency and introduces new or revised control methods and procedures, as needed.

Recordkeeping

All completed LOTO appendices must be maintained for EHS review.

Discipline

Employees are subject to discipline when they fail to LOTO before performing work on any equipment per ASU policy SPP 809 Discipline.

Employees are subject to appropriate discipline that may include termination of employment if they remove a personal lockout lock or tag other than their own without prior approval from their supervisor. Note: This does not include general equipment locks or tags.

Employees are subject to appropriate discipline that may include termination of employment if they energize any equipment properly LOTO by other employees. Note: This includes both types of LOTO.

Appendix A

Definitions:

Affected employees: “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.” OSHA 1910.147(b)

Authorized employees: “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 under this section.” OSHA 1910.147(b)

Authorized, or qualified, employees are the only workers certified to lock and tag out equipment or machinery. Whether an employee is considered qualified depends upon various circumstances in the workplace. An individual can be considered qualified with certain equipment in the workplace, but unqualified for other equipment. An employee undergoing on-the-job, or OJT, training and who, has demonstrated an ability to perform duties safely at their training and is under the direct supervision of a qualified person, is considered to be qualified for those duties.

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.” OSHA 1910.147(b)

Energized: “Connected to an energy source or containing residual or stored energy.” OSHA 1910.147(b)

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.” OSHA 1910.147(b)

Energized source: “Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.” OSHA 1910.147(b)

Hot tap: “A procedure used in the repair, maintenance, and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.” OSHA 1910.147(b)

Lockout: The act of physically securing by locking means, if possible, any sources of energy to prevent inadvertent energization or accidental startup of equipment or systems.

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 the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.” OSHA 1910.147(b)

Normal production operations: “The utilization of a machine or equipment to perform its intended production function.” OSHA 1910.147(b)

Servicing and 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 unjamming 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.” OSHA 1910.147(b)

Setting up: “Any work performed to prepare a machine or equipment to perform its normal production operation.” OSHA 1910.147(b)

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.” OSHA 1910.147(b)

Zero state or zero-point energy: The lowest possible energy that a physical system may possess or its neutral state. It is the energy of the ground state of the system. All mechanical systems have a zero point of energy.

Appendix B

Energy control procedure template

Scope:

This lockout procedure is for a specific machine or equipment that this procedure applies to:

_____
_____
_____

Purpose:

- This procedure establishes the minimum requirements necessary to protect employees from injury caused by the unexpected energization, start up or release of stored energy during service or maintenance.
- Use this procedure to make sure the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before any employee begins work.

Authorization:

- The following persons are authorized to lock out the machine or equipment using this procedure. | List the names of authorized employees you want to use this procedure:

_____
_____
_____

Compliance with this program:

- All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout.
- Authorized employees will perform lockout as described in this procedure.
- No employee will attempt to start, energize or use any machine or equipment that is locked out.
- Failure to comply with this procedure will result in disciplinary action.

Intended use:

- This procedure will be used for the following service or maintenance actions | List the service and maintenance activities that require using the procedure:

_____
_____
_____
_____

Specific procedural steps:

Step 1: The authorized employee will identify the type and magnitude of the energy that the machine or equipment uses, understand the hazards of the energy, and the methods to control the energy before using this procedure. | List the type and magnitude of the energy, its hazards, and the methods to control the energy.

Step 2: Notify all affected employees that the machine or equipment is to be shut down and locked out for service or maintenance. | List the names or job titles of affected employees and how to notify them (i.e. verbally):

Step 3: Shut down the machine or equipment by the normal stopping procedure (such as depressing a stop button, opening switches, or closing valves). | List types and locations of machine or equipment operating controls.

Step 4: Completely isolate the machine or equipment from its energy sources by using the appropriate energy-isolating devices. List types and locations of energy-isolating devices.

Step 5: Lock out the energy isolating devices with assigned individual locks. | List any additional procedural requirements, such as putting on a tag with amplifying information, necessary for the authorized employee to know:

Step 6: Dissipate or restrain stored and residual energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam or water pressure, using methods such as grounding, repositioning, blocking or bleeding down. | List the types of stored and residual energy and the methods to dissipate or restrain them.

List any actions necessary to prevent stored energy from re-accumulating to a hazardous level:

Step 7: Make sure the equipment is disconnected from the energy sources and stored and residual energy has been made safe. Check that no personnel are exposed, and then verify the isolation of the equipment by doing the following: | List the method of verifying machine or equipment isolation, such as operating the push button or other normal operating controls or by testing to make certain the equipment will not operate.

Caution: Return the operating controls to the **safe, neutral** or **off** position, after verifying the equipment is isolated from its energy sources.

The machine or equipment is now locked out

Restore the machine or equipment to service after the service or maintenance is completed and the machine or equipment is ready to return to its normal operating condition by doing the following steps:

Step 1: Check the machine or equipment and the immediate area around it to make sure all nonessential items have been removed and that the machine or equipment is in operating condition and ready to energize.

Step 2: Make sure all employees are safely positioned for starting or energizing the machine or equipment.

Step 3: Verify that the controls are in neutral.

Step 4: Remove the lockout devices and reenergize the machine or equipment.

Note: Some forms of blocking may require re-energization of the machine before they can be safely removed.

Step 5: Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready to use.

Appendix C

Annual inspection form

Annual review information — IAW 29 CFR 1910.147(c)(6) Periodic inspection			
Department or zone:		Date:	
Authorized inspector*:			

*The authorized inspector is an authorized employee other than the authorized employee undergoing annual review.

Step one: General information

Name and location of system or equipment
Does this system or equipment require an energy control procedure to perform service or maintenance? Yes ☐ No ☐
Authorized employees being reviewed:
Affected employees:

Step two: Ensure the following steps are taken for LOTO of the machine or equipment. Explain any deficiencies

	Step	Yes	No	N/A	Deficiencies or comments
1	Prepare for the shutdown: Obtain equipment, and complete the energy control procedure, if applicable.	☐	☐	☐	
2	Notify all affected employees of the lockout.	☐	☐	☐	
3	Turn off the machine or equipment through operational controls.	☐	☐	☐	

4	Locate and isolate the energy control devices.	☐	☐	☐	
5	Apply lockout and tagout devices: One lock and one tag per employee performing the work.	☐	☐	☐	
6	Dissipate stored energy.	☐	☐	☐	
7	Verify a zero-energy state of the machine or equipment.	☐	☐	☐	
8	Perform service or maintenance.	☐	☐	☐	

Step three: Ensure the following steps are taken to restore energy to the machine or equipment. Explain any deficiencies

	Step	Yes	No	N/A	Deficiencies or comments
1	Clear area of personnel, tools and materials.	☐	☐	☐	
2	Re-install machine guards.	☐	☐	☐	
3	LOTO devices are removed only by the employee who placed them.	☐	☐	☐	
4	Restore power to the machine or equipment.	☐	☐	☐	
5	Conduct a safe trial run.	☐	☐	☐	
6	Notify affected employees of completed LOTO.	☐	☐	☐	

Step four: LOTO procedures review

	Question	Yes	No
1	Does the department conduct group lockout? Review procedure.	☐	☐
2	Does the department conduct LOTO work across shifts and personnel changes? Review procedure.	☐	☐
3	Does the department have an emergency lock removal procedure? Review procedure.	☐	☐
4	Have authorized LOTO employees demonstrated ECP and general LOTO procedures effectively.	☐	☐

Step five: Corrective actions

Deficiencies may be corrected through revised procedures, training or both.
In the space provided below, please explain the corrective actions to be taken, if applicable.

Step 6: Verification

Authorized inspector verification:

Authorized inspector signature: _____ Date: _____

EHS certifies that the inspection was completed.

EHS representative name: _____

EHS representative signature: _____ Date: _____

Retain this record for a year or until the next inspection.

Appendix D

Abandoned lock removal form

IAW 29 CFR1910.147(e)(3)

Only supervisors can remove abandoned locks. This completed form must be submitted to EHS. Justification: Explain why it is necessary to remove this lock:

_____
_____
_____
_____

Name of person whose lock must be removed, print:

_____
_____

Have all reasonable efforts been made to contact the authorized employee to inform them that their LOTO-Verify devices have been removed?

Yes ____ No ____

Has verification been completed by the supervisor that the authorized employee who applied the device is not at the facility?

Yes ____ No ____

Has the authorized employee been provided this knowledge before they resume work at that facility?

Yes ____ No ____

Are you sure it is now safe to remove this lock?

Yes ____ No ____

Supervisor's name: _____

Signature: _____ Date: _____