Arizona State University
Environmental Health and Safety

The Control of Hazardous Energy Program
Lockout | Tagout | Verify
February 2021
**Purpose:** Control of hazardous energy is the purpose of the Lockout-Tagout-Verify Program, or LOTO. This program establishes the requirements for Isolation of both kinetic and potential electrical, chemical, thermal, hydraulic and pneumatic and stored gravitational energy prior to equipment repair, adjustment or removal.

**Ref. & IAW:** OSHA Standard 29 CFR 1910.147, The Control of Hazardous Energy (lockout / tagout)

**Background:** The ASU Lockout/Tagout Program establishes procedures required of all ASU employees to be in compliance with OSHA control of hazardous energy (lockout / tagout) standard (29 CFR 1910.147, established Sept. 1, 1989).

**Applicability:** All ASU employees.

**Definitions**

**Authorized (Qualified) employees** – are the only ones certified to lock and tagout equipment or machinery. Whether an employee is considered to be “qualified” will depend upon various circumstances in the workplace. It is likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. An employee who is undergoing on-the-job (OJT) training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered to be "qualified" for the performance of those duties.

**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.

**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.

**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** – the act of physically securing by locking means, if possible, any and all sources for energy to prevent inadvertent energization or accidental startup of equipment or systems. This is a personnel safety procedure.

**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.
**Energized source** – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

**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.

**Lockout** – The act of physically securing by locking means, if possible, any and all sources for 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.

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

**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 deenergization 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.

**Zero state (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.
Procedure
Locks for personal safety will be provided or made available by the employee supervisors. All lockout tags, multiple hasp, and clamshell locking devices will be stocked in the Facilities Management Maintenance Stores Warehouse.

- Locks for Personal Safety – ASU approved steel locks shall be used for LOTO and shall be yellow in color. Locks must be yellow in color as approved by ASU EHS and Facilities Management, Master Lock model #6835 or updated Master Lock model for Lock Out Tag Out.

- Locks for Securing Equipment - American Standard 1105 (Key cylinder # 63485) should be used for equipment Out of Service/Custodial locks and shall be red in color.

All personal safety locks will have only have one key existing for the lock and 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. When a piece of equipment is locked out, a personal safety lock and tag will be attached at the disconnecting means of the equipment.

All equipment that is to be serviced or worked on or adjusted shall be locked out with a personal safety lock and tag prior to work being performed on the equipment or system to ensure protection against accidental or inadvertent operation when such operation could cause injury to personnel.

All equipment that is to be serviced or worked on or adjusted shall be locked out with a personal safety lock and tag prior to work being performed on the equipment or system to ensure protection against accidental or inadvertent operation when such operation could cause injury to personnel.

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 deenergize and deactivate the machine or equipment; (4) the machine 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; and (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.

When an energy control procedure is required, a qualified employee may develop it using the template in the appendix of this procedure. Each developed energy control procedure shall be submitted to the employee(s) supervisor and maintained in each department for future reference.

Basic rules for using the lockout/tagout / verify system
All equipment that is to be serviced or worked on or adjusted shall be locked out and tagged out prior to work being performed on the equipment or system to ensure protection against accidental or inadvertent operation when such operation could cause injury to personnel.
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 to “zero” state.

**Purpose:** When a piece of equipment is to be inspected, cleaned repaired or worked on by an employee, that piece of equipment must have all energy sources removed or otherwise controlled prior to commencing work on the equipment. The electrical energy source will be removed or controlled by an Electrician at the request of other units.

**Note:** All sources (energy) must be VERIFIED “Zero” state before work may begin.

Only those Electricians trained and qualified to operate the ASU electrical primary distribution system will be the “only” authorized personnel to lockout/tag out primary power sources.

Electricians will be authorized to lockout/tag out motors and machines for both their safety and the safety of other employees.

**Procedure: Personnel Safety Lockout**

*Note: ASU utilizes the lock with tag system, tag only is prohibited at ASU.*

Each employee shall be issued a set of safety lockout locks and tags consisting of the following:

1. Tags must include the words **Danger**: Do Not Start, Do not open, Do not close, Do not Energize, Do not Operate or similar phrasing. At a minimum the tags must include the employee name, employee photo, and ASU Facilities Management Service Center phone number or employee department’s phone number for non-Facilities Management employees.

2. Personal safety locks will have only one key existing for the lock and issued to the employee by their supervisor. Each assigned lock shall include at a minimum the employee’s name and ASU Facilities Management Service Center phone number or employee department’s phone number for non-Facilities Management employees. 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 locks and tag out devices must be used by all employees who work on, adjust, repair or replace equipment that has the potential for storing energy.

   b. The requesting unit(s) and any other units, who are working on a piece of equipment, or system, must install each of their own personal safety locks. Multiple lock hasps (gang hasps) will be used when more than one individual is working on the equipment or a system.

**Lockout devices** - 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.

**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. **Danger:** Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate, or similar phrasing.
**Identifiable** - Lockout devices and tagout devices shall indicate the identity of the employee applying the device. 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. Do Not Operate.**

**Preparation for lockout/tagout/verify**
The following steps for electrical shut down shall be followed. A Lockout/Tagout survey must be conducted to locate and identify all energy sources needing lock and tagout. Dual or redundant controls have been identified and all sources of energy will be secured, blocked, wedged, or otherwise restrained in a safe state. If an energy control procedure is available it must be reviewed and followed.

If one is not available, but required it is to be developed using the template provided in Appendix A and followed during the lockout/tagout activity and submitted to the Shop Supervisor at the completion of the lockout/tagout activity.

a. All sources of hazardous energy must be identified prior to work commencing. This will allow the employee to properly assess and acquire the proper lockout and securing devices to ensure their safety. A tagout schedule must be developed for each piece of equipment and machinery and should be kept on file for future reference or use. This schedule describes the energy sources; location and type of disconnect means.

b. When shutting down any primary electrical equipment, a shutdown procedure will be written in advance and approved by an Electrical Services supervisor.

Note: Proper personal protective equipment and clothing must be worn and the ASU Electrical Safety Program followed for all energized circuits at or above 50 volts.

c. Locks and tags are to be used to lock out electrical switches, breakers and disconnect means provided for that purpose. Securing or locking out other equipment with the use of chains or other safety support devices maybe required. Tags must be used with these devices as well.

Note: When the power source is over 220 volts between phases or above, only employees considered qualified under the ASU Electrical Safety Program may disconnect power sources.

**Stored energy**

a. Following the application of the lockout or tagout devices to the energy isolating devices, all potential or residual energy will be relieved, disconnected, restrained, and otherwise rendered safe.

b. Where the re-accumulation of stored energy to a hazardous energy level is possible, verification of isolation will be continued until the maintenance or servicing is complete.

c. Release stored energy (capacitors, springs, elevated members, rotating fly wheels, and hydraulic/air/gas/steam systems) must be relieved or restrained by grounding, repositioning, blocking and/or bleeding the system.

**Verification of isolation**

a. Prior to starting work on machines or equipment that have been locked or tagged out, the authorized employees will verify that isolation or de-energization of the machine or equipment have been accomplished.
b. After assuring that no Employee will be placed in danger, test all lock and tag outs by following the normal start up procedures (depress start button, etc.).

c. Caution: After Test, place controls in neutral position.

**Release from lockout/tagout**

Before lockout or tag out devices are removed and the energy restored to the machine or equipment, the following actions will be taken:

a. The work area will be thoroughly inspected to ensure that nonessential items have been removed and that machine or equipment components are operational.

b. The work will be checked to ensure that all employees have been safely positioned or removed. Before the lockout or tagout devices are removed, the affected employees will be notified that the lockout or tagout devices are being removed.

c. Each lockout or tagout device will be removed from each energy isolating device by the employee who applied the device.

**LOTO procedure for electrical plug-type equipment**

This procedure covers all Electrical Plug-Type Equipment such as Battery Chargers, some Product Pumps, Office Equipment, Powered Hand Tools, Powered Bench Tools, Lathes, Fans, etc. When working on, repairing, or adjusting the above equipment, the following procedures must be utilized to prevent accidental or sudden startup:

a. Unplug Electrical Equipment from wall socket or in-line socket.

b. Attach "Do Not Operate" Tag and Plug Box & Lock on end of power cord. **Exception** - not to lock and tag the plug if the cord and plug remain in the exclusive control of the employee working on, adjusting or inspecting the equipment.

c. Test Equipment to assure power source has been removed by depressing the "Start" or On" Switch.

d. Perform required operations.

e. Replace all guards removed.

f. **Exception** - not to lock and tag the plug if the cord and plug remain in the exclusive control of the employee working on, adjusting or inspecting the equipment.

g. Inspect power cord and socket before plugging equipment, any defects must be repaired before placing the equipment back in service.

**LOTO procedures involving more than one employee**

If more than one Employee is assigned to a task requiring a lock and tag out, each must also place his or her own lock and tag on the energy isolating device(s). If more than one employee is working on the same piece of equipment at the same time, each employee is to have their own lock on the lockout device.

The first employee applying the lock and tagout on the equipment or system will use a group hasp to accommodate for multiple individual locks and tags. Individual tags must be placed with the individuals lock to ensure consistency and traceability.

The general equipment unit lock(s) will be 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. 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 – the lock for securing equipment will be removed and a personal safety lock and tag will be used as protection for the equipment and for employees.
**Extended lockout/tagout**

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

**Management's removal of lock and tag**

Only the Employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the employee leave the facility before removing his/her 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 C is completed.

**Contractors**

Contractors, working on ASU property and equipment must comply with lockout tagout and energy control procedures as prescribed under 29CFR1910.147 while servicing, maintaining or installing equipment, machinery or processes. 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 lockout/tagout procedures and inform each other of the specific procedures being followed while working in the same location. During a machine/equipment control “out of service” situation, the ASU program must be followed by parties.

**Machine and equipment control (equipment or “out of service/custodial” lock)**

All energy control devices that are 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 that is to be serviced or worked on or adjusted shall be locked out with a personal safety lock and tag prior to work being performed on the equipment or system to ensure protection against accidental or inadvertent operation when such operation could cause injury to personnel.

Should the shift change before the machinery or equipment can be restored to service, or if the employee leaves the area for any substantial length of time, the personal safety lock and tag out must be removed and replaced with a lock for securing equipment. If the task is reassigned to the next shift, those 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 applicable.

Locks for Personal Safety – ASU approved steel lock shall be used for LOTO and shall be yellow in color. Locks must be yellow in color as approved by Environmental Health and Safety (EHS) and Facilities Management, Master Lock model #6835 or updated Master Lock model for Lock Out Tag Out.

Locks for Securing Equipment - American Standard 1105 or equivalent approved by EHS and Facilities Management should be used for equipment Out of Service/Custodial locks and shall be red in color. No other colored lock shall be used for securing out of service equipment.

Tags are not required for locks securing equipment from unauthorized entry (custodial locks). Employees and contractors who have questions related to general equipment locks, should contact ASU Facilities Management Service Center.
Group lockout/tagout/verify

If the primary locking device will not accommodate each employee’s lock, multiple locking devices are to be used in this situation. When multiple locking devices are required, the shank of the multiple devices must immobilize the equipment and not merely be attached to the shank of another lock.

a. Before work commences, the employee will make certain that the equipment is immobilized by pushing the start button in the field. Only after the entire area has been inspected and each employee has been advised, that the test will be performed.

b. If an employee has any doubt as to the location of lockout switches, lockout procedures, job procedure or any other questions pertaining to their particular job assignment, all doubt will be removed before starting the job by asking their supervisor for assistance or clarification.

c. Whenever it might become necessary to operate or test the equipment during the work assignment, one employee will be designated or assigned to operate the equipment. After each employee removes their lock and tag, and only after the entire area has been inspected to make certain that each employee has been advised of the intent to operate and assuring everyone is in the clear, will the assigned employee operate the equipment.

d. Each employee who will continue to work on the equipment will replace their lock and tag on the lockout device after the test is performed. Then before proceeding to work on the equipment, the retesting of the equipment will be conducted to assure no energy source is present and after checking to make sure everyone is clear of danger.

e. All work performed on the equipment will be accomplished in a safe and prescribed orderly manner ensuring “Zero” state.

f. Tags **must** be used in addition to the locks, and **may not** substitute for the lock. Each unit involved in the repair or maintenance of a particular piece of equipment or system working on the job will provide their own personal lock and tag.

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

h. When work is completed, all tags and locks will be removed by the employees. The last employee in each unit assigned to the job will remove the unit tag. Only after the lock(s) and tag(s) have been removed, and the area inspected and checked for hazards and assuring that all employees are clear, the equipment or system may be placed back into service.

i. If an employee leaves the facility before removing his/her 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 C is completed.

j. Each employee will be assigned a key to their personal safety lock. A duplicated key cannot be made or given to a second party or left for others to use.
Routine maintenance
If routine maintenance and machine adjustments are required, lockout and tag out procedures are not required, if equipment must be operating for proper adjustment. This rare exception may be used only by trained and authorized Employees when specific procedures have been developed to safely avoid hazards with proper training. Where applicable, these activities are to be identified on the energy control procedure. All consideration shall be made to prevent the need for an employee to break the plane of a normally guarded area of the equipment by use of tools and other devices.

Periodic inspecting program
ASU conducts a periodic inspection of the Energy Control Procedure (ECP) at least annually to ensure that the procedure and the requirements of this standard are being followed.

The periodic inspection is performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

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

Where lockout is used for energy control, the ECP periodic inspection includes a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

Where tagout is used for energy control, the periodic 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 set forth in paragraph (c)(7)(ii) of 29 CFR 1910.147 (Tagout training and procedures).

Each year the ASU inspector will certify that the periodic inspection has been performed. The certification identifies the machine or equipment on which the energy control procedure is being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

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

Training
All authorized employees are provided training on the LockOut/TagOut/Verify Program procedures IAW all applicable standards of 29CFR1910.147.

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

New employees must first be trained in LOTO prior to conducting work that is 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 shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

Additional retraining shall also be conducted whenever a periodic inspection whenever the employer has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

ASU shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.
Recordkeeping
All completed LOTO Appendices must be maintained in the FDM file for review by EHS.

Discipline
When an employee fails to lock and tag-out any equipment prior to performing work on that equipment, that employee will be subject to discipline according to ASU policy SPP 809 Discipline.

If an employee removes a personal lockout lock or tag other than their own without prior approval from their supervisor, the employee will be subject to appropriate discipline that may include termination of employment. Note: this does not include general equipment locks or tags.

If an employee energizes any equipment that has been properly tagged by other employees, that employee will be subject to appropriate discipline which may include termination of employment. Note: this includes both types of tags.
Determination Flow Chart For LockOut Procedure (Appendix A) Development
Machine/Device/System (MDS)
Ref: 29CFR1910.147

MDS: __________________________________________; Model: ______________________

Circle The Appropriate YES or NO Box

1. The MDS has **NO POTENTIAL** for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.

   YES → Complete Appendix A

   NO → Complete Appendix A

2. Does the MDS have a **SINGLE** energy source which can be readily identified and isolated?

   YES → Complete Appendix A

   NO → Complete Appendix A

3. Will the isolation and locking out of that energy source completely de-energize and deactivate the machine or equipment?

   YES → Complete Appendix A

   NO → Complete Appendix A

4. Is the MDS isolated from that energy source and locked out during servicing or maintenance?

   YES → Complete Appendix A

   NO → Complete Appendix A

5. Is the lockout MDS under the exclusive control of the authorized employee performing the servicing or maintenance and a single lockout device will achieve a locker-out condition?

   YES → Complete Appendix A

   NO → Complete Appendix A

6. The servicing or maintenance of the MDS **DOES NOT** create hazards for other employees?

   YES → Complete Appendix A

   NO → Complete Appendix A

If "YES" to all 6 questions it is **NOT** necessary to Complete Appendix A.
APPENDIX A
Energy control procedure template

Scope:
This lockout procedure is for (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 the following 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):

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
Procedural steps: (continued)

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 B

## Annual Review Information – IAW 29CFR1910.147(c)(6)

<table>
<thead>
<tr>
<th>Department:</th>
<th>Date:</th>
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<tbody>
<tr>
<td>Supervisor:</td>
<td>Reviewer:</td>
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<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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</table>

1. Are department personnel who conduct work covered by this manual trained as Lockout Authorized Employees? List those who are trained and those who are not trained but need it.

2. Are department Lockout Authorized Employees familiar with and follow the General Lockout Procedure?

3. Have Energy Control Procedures been developed in accordance with the General Lockout Procedure? List Energy Control Procedures needed and whether they have been developed.

4. Does the department have adequate locks, tags, and lockout devices? List what is needed and whether or not the department has them.


7. Does the department have an Emergency Lock Removal procedure? Review key security method and list persons who will implement the Emergency Lock Removal procedure/form.

8. Have Lockout Authorized Employees demonstrate Energy Control Procedures or General Lockout Procedure as appropriate. List Energy Control Procedures demonstrated and the Lockout Authorized Employee who demonstrated.
APPENDIX C
ABANDONED LOCK REMOVAL FORM
IAW 29CFR1910.147(e) (3)

Only supervisors can remove abandoned locks. This completed form must be submitted to asu 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 (print):_____________________________________________

Signature: __________________________________________________________

Date: _________________________

Questions? Contact ASU Environmental Health and Safety at 480-965-1823 or email asuehs@asu.edu.

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