



**Department of Environmental Health & Safety**

# Lock Out/Tag Out Program

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## General Policy – Ohio University Lockout/Tagout Policy

### I. BASIC PRINCIPALS

A zero energy state must be achieved prior to performing work on equipment. This is the state where all sources of energy are identified, isolated, and stored energy relieved.

Personal locks and tags must be applied by anyone performing work on equipment and the key must be kept in the employee's possession at all times.

The Owner/Operator is responsible for properly clearing and securing equipment.

Each individual is responsible to ensure that the equipment has been properly locked out.

Verification is essential – do not short-cut the Try and Test steps.

### II. PURPOSE

The purpose of this procedure is to specify the minimum locking, tagging, clearing, and trying steps necessary to render machinery, equipment, and process in a safe condition for maintenance or service work to be performed. This procedure applies to anyone working on equipment at Ohio University, whether an Ohio University employee or a contractor.

This Procedure applies to work where the hazards can be isolated prior to the work beginning. For work in which the hazards cannot be completely isolated, other written procedure specific to the work shall be used. Examples of activity where this procedure might not apply are ultrasonic thickness checks on pipes/equipment, or bumping a motor to align a gear when there is no possibility of personal contact with equipment in motion. Each department is responsible for documenting any isolation procedures not specifically covered by this Procedure.

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

While any employee is exposed to contact with parts of fixed electrical equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out and tagged in accordance with the requirements of 29 CFR 1910.333 (b) (2).

Exceptions to this procedure must be documented and approved by the Department Director, and the OSHA Coordinator, or a member of the Lockout

Committee. The documented exception is to be maintained in the affected Department safety and/or operating procedures.

This standard is specifically related to the execution of lockout. Departments are responsible for ensuring that systems are cleared. Energy sources that are generally, but not always, exempt from this procedure are less than 20 PSI pneumatic air (i.e., instrument tubing) and less than 30 volts DC or AC (i.e., changing batteries in a radio, smoke detector, a vehicle, or inspection of DC motors.)

The Lockout/Tagout procedure will be reviewed by the Lockout/Tagout Committee on an annual basis or more often as deemed necessary by the Committee. This will include the regulations and the implementation and use of the procedure in protecting employees at Ohio University.

**NOTE:** Any violations of this procedure will be considered a Serious Incident and investigated by the OSHA Coordinator and representative of the Lockout/Tagout Committee in conjunction with employees involved and supervision. Appropriate discipline will be issued according to the severity of the violation and in accordance with University policy.

### **III. DEFINITIONS**

Audit – a check out method to ensure compliance with Ohio University’s Lockout /Tagout procedure

Qualified – One who is thoroughly knowledgeable in the construction and operation of specific equipment or a specific task and the hazards associated with that equipment or task.

Affected – 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 whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized – A person who locks out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee’s duties include performing servicing or maintenance covered under this section.

Owner/Operator – The owner/operator of equipment or systems. Typically it will be the Department that utilizes the equipment. It can also be the person that is familiar with the use and lockout techniques associated with that particular piece of equipment.

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

For additional definitions see 29 CFR 1910.147 (b).

#### **IV. INTENT**

Each employee or contractor is responsible for their own safety, that of their fellow employees, and the safety of the equipment they are working with. Each individual must exercise good judgment when applying this policy. It is the intent of this procedure to:

- Provide an important safety check prior to the performance of any work.
- Ensure that the equipment to be worked on is isolated from all energy sources and any hazardous materials.
- Ensure all communications between groups and individuals are complete with respect to:
  1. status of the equipment
  2. status of the work in progress
- Provide understanding to each individual around the following:
  1. personal acceptance of responsibility and accountability
  2. proper authority
  3. proper training

All equipment installed after 1/1/90 must be designed with lockout capability.

Effective with the implementation of this procedure, all lockouts and tags as well as the valve locking devices will comply with 29 CFR 1910.147. 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. The lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques such as bolt cutters or other metal cutting tools.

#### **V. APPLICATION**

Lockout is the required method of securing machines, equipment, or piping from energy sources. All systems with a potential energy source (electric, pressure, vacuum, gravity, spring, rotation, etc.) must be secured and locked in a manner to provide personal protection before work is performed. Unless verified otherwise, all equipment, vessels, and/or pipelines are assumed to be powered, full, under vacuum, pressurized, or electrically energized.

If outside contractors perform servicing or maintenance that requires lockout, the Ohio University representative controlling the project shall take the following steps.

1. Inform the outside contractor of Ohio University's Lockout/Tagout Procedures and supply them with a copy.
2. Obtain and review a copy of the outside contractor's lockout procedures.
3. Ensure that Ohio University's employees understand and comply with the responsibilities and prohibitions of the outside contractor's lockout procedure if used and if agreed to by the Lockout/ Tagout committee and contracting company. If not agreed upon, the contracting company will utilize the procedures as set in by the University. It is noted that in order to use the contracting company's procedure, it must at least be as stringent as the University's procedure in order to protect the employees of both respective parties and the property of the University.

## **VI. RESPONSIBILITY**

- The individual operating and/or working on the equipment must be qualified and is responsible for knowing, understanding, and properly implementing the Lock, Tag, and Try Procedure.
- The owner/operator is responsible for ensuring equipment is properly secured and cleared prior to the start of work.
- Each authorized individual working on the equipment is responsible for insuring that the equipment is properly locked out to adequately protect them from all hazards.
- Supervision is responsible for ensuring proper training of authorized, affected, qualified and other personnel in the purpose and proper implementation of the Lock, Tag, and Try Procedure, and to audit as required to ensure compliance. The training shall 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. See department training plans for specific requirements.
- Each Department will certify that the initial Lockout/Tagout training has been done and documented. A review and audit by the Department will be done of this training and of training records on an annual basis.
- Refresher training on Lockout/Tagout procedures will be conducted when there are changes in the procedure and/or if supervision deems necessary. Documentation will be kept in the Department of Environmental Health and Safety Office.
- Each Department will test understanding and application of this Procedure in their facilities through a Job Safety Check. This Job Safety Check field audit of actual application must be completed and documented at least once per year.
- Each Department will provide ODs (Operational Directions) or checklists to ensure adequate clearing of the system.

## **VII. LOCKS**

The 4 types of locks in use at Ohio University are defined as follows:

#1 Shop Lock – Series of locks all keyed alike with multiple keys in the possession of the owner/operator group. This lock is used for clearing purposes by the equipment owner/operator on individual lockouts. The shop lock is the first lock on and the last lock off. No work can be performed under a shop lock by itself.

#2 Personal Lock – A single lock or series of locks that has one key which the employee keeps in his possession. There are no master keys or duplicate keys for a personal lock. This represents the employee's individual safety protection for the job. Contractor personal safety locks shall be of an equivalent strength and durability to the University supplied locks.

#3 System Lock – Series of locks with a single key such that a system can be locked out with multiple locks having just one key. There are no master or duplicate keys for system locks.

NOTE: Unused system locks shall be controlled by the owner/operator.

#4 Equipment Safety Lock – These locks are assigned to equipment that requires routine lockout for minor servicing and adjustments to operating equipment. These locks must be attached to the equipment and will have one key. The operator must lock the equipment and keep the key in his/her possession during work. This lock must be accompanied by a properly signed Danger Tag and may not be used for Mechanical work. Only the person placing the Equipment safety Lock may work under the lock. (Lockout checklists are not required for equipment safety lockouts.)

## **VIII. TAGS**

Danger Tag – A properly identified Danger Tag must always accompany a lock. The tag will explain the purpose of the lockout and must be dated and signed by the employee placing the tag. Only the person who placed the tag may remove it, unless otherwise directed by Supervision (NOTE: This does not apply to the tag accompanying a Shop Lock). On piping systems, properly completed Danger Tags and locks are used on all valves associated with the job task. Danger tags left on equipment for more than 60 days must be updated and signed before the end of the 60 day period. (See Out of Service Tag)

Work Incomplete Tag – This tag is placed with the shop lock(s) upon start of work by each work group. The purpose of the tag is to communicate that a particular group's work is incomplete even though the personal locks may have been pulled at shift change. The tag is hung at each shop lock(s) by a designated person from each group that has work in progress. The tag can be removed by

any member of that work group that knows that his/her group's total job is complete.

Restricted Tag – When equipment requires operation by personnel other than the owner/operator group for check-out/testing/troubleshooting, a Restricted Tag shall be placed specifying the group to operate the equipment. While the Restricted Tag is in place, the designated group will be responsible for all Lock, Tag and Try procedures (and becomes the owner/operator until the Restricted Tag is removed).

Out-of-Service Tag – When equipment is taken out of service but remains in place, an Out of Service Tag must be attached, properly signed and dated, with the reason the equipment is no longer serviceable.

**NOTE:** An Out-of-Service Tag cannot be used on equipment which is still electrically or mechanically connected to a power or process source.

## **SECTION 2: PROCEDURE EXECUTION**

### **I. LOCKOUT METHODS**

There are two accepted methods for lockout. One is called Simple Lock Out and the second is called System Lockout. A method of documenting lockout points will be used for any system lockout. A lockout description in the Operating Directions (ODs) or a lockout checklist are acceptable methods of documentation. The Lockout Checklist (or ODs) shall be readily accessible.

Simple Lockout – This approach is used when a job is relatively straight forward, involving a small number of locks, few people and not expected to go on for more than one shift. (The use of an Equipment Safety Lock is a special case of Simple Lockout.) The steps for a Simple Lock out are as follows:

- A) Each person who is to do work on the system shall put his/her own Personal Lock and completed danger tag on each energy source and keeps the key in their possession. For jobs lasting longer than 1 shift or have more than 1 work group, a Work Incomplete Tag shall be placed with the shop lock(s) upon the start of work by each work group.
- B). Upon completion of work, personal locks and tags shall be removed.
- C). Each work group removes their shop lock and tag.

System Lockout – A system lockout is used when the lockout is complex requiring multiple locks, numerous workers and/or the job is expected to go on for several shifts. The owner/operator will decide whether a system lockout should be

used based on his/her understanding of the work to be performed. The steps for a System Lockout are as follows:

- A.) The equipment is to be cleared by the owner/operator using a lockout checklist or OD's, System Locks and properly completed danger tags. Those working on the job may want to accompany the owner/operator during the clearing process to insure adequate set up had occurred.
- B.) The key to the System(s) Locks will be placed in a System Lock box. The System Lock box will have a clear viewing window and the box must be capable of being locked shut. It will be the Department's responsibility to label and identify the multiple system lockboxes (numbers, labels, or colors). The department will then lock the box with their own shop lock and tag. The lockout checklist or OD's shall be kept readily accessible and cross-referenced to the proper system lockbox. Completed lockout checklist or checked off copy of OD's should be placed at the lockbox.
- C.) Each work group will place a Shop Lock with properly filled out work incomplete tag on the lock box.
- D.) Each individual, assures themselves that the equipment had been properly locked out, will place their personal lock and properly filled out danger tag on the lock box hasp.
- E.) Upon completion of work, "work incomplete" tags and personal locks and tags shall be removed.
- F.) The work group removes shop locks and tags from lockbox.
- G.) The department removes their shop locks and tags.

## **II. ELECTRICAL LOCKOUT**

Proper identification by the owner/operator of the disconnecting devices for the equipment to be locked out is essential. The equipment tags must clearly and uniquely identify the disconnecting devices for the equipment to be worked on.

### **OWNER/OPERATOR RESPONSIBILITY**

- A.) Identify the proper disconnecting devices for the equipment to be worked on using the checklist or OD's.
- B.) Try to start the equipment using the nearest start/stop device (if available). (Do not try to start the equipment if this action would create a hazard.) If the equipment starts, the proper start/stop device has been

identified. If the equipment does not start, the following are possible causes:

- \* The wrong start/stop device
- \* Process interlocks
- \* Safety interlocks
- \* Fuses
- \* Overloads
- \* Multiple (parallel) stop/start devices are not in the “RUN” position

NOTE: Some packaged equipment, such as conveyers, palletizers, etc., may have a “group control device” (i.e GROUP JOG/GROUP TRY/GROUP OFF) which will operate more than one device.

The owner/operator must know which start/stop device and/or main disconnect activates the equipment.

Interlocked equipment may require a by-pass to initiate the try step. Some equipment may have a test light to enable the try step. If the “try light” exists, use this for the try step.

- C.) Lock & Tag the start/stop devices in the “OFF” position (if available)
- D.) Using proper electrical PPE and recommended body position, throw the switch on the main disconnect device to the “OFF” position. Field disconnects may be use in place of main disconnects when the total power to the equipment being serviced flows through the field disconnect or when the field disconnect is clearly labeled with the additional power sources that must also be locked out to fully de-energize the equipment.

NOTE: If electrical work is to be performed on equipment or circuits, have a qualified individual open the main disconnects and visually verify that the knife blades have fully separated. The circuit must be tested for the absence of voltage. If visual verification cannot be made, the fuses must be pulled. The qualified individual shall close the main disconnect door. The owner/operator shall lock the main disconnect and tag it with a fully filled out Danger Tag including a statement that the main disconnect had been verified.

- E.) If work other than electrical work is to be done, the disconnect can be locked and tagged without the physical verification.
- F.) Remove lock and tag from the device identified in Item ‘II.C’, and “try” to start the equipment. (Make sure that all steps in Item ‘B’ have been satisfied)

NOTE: An alternative “try” device may be provided. If a “try light” exists, use this for the try step.

- G.) Reinstall lock and tag on the start/stop device in the “OFF” position if available.

### INDIVIDUAL RESPONSIBILITY

- A.) Individuals performing work on equipment must ensure with the equipment owner/operator that the desired equipment had been properly secured and is ready to be worked on. Authorized individuals must conduct the try and test steps.
- B.) Anyone working on the system must be sure they understand the purpose of the locks/tags placed by the owner/operator, in order to verify that the system is safe for work. Each person may request evidence of the try step.
- C.) The individual should mark the group designation on the danger tag when it is placed.
- D.) For Simple Lockout, each individual performing work on the equipment must attach his personal lock and tag on the main disconnect and also must lock and tag the nearest start/stop device (if available). For System Lockouts, the individual must attach a personal lock and tag to the System lockbox.
- E.) Plug-connected 120 VAC electrical equipment may have work performed on them if the plug is unplugged and under the exclusive control of the person performing the work. **Exclusive control means within reach and within sight, within the employee’s complete care custody and control.**
- F.) When the work is complete, the last individuals to remove their lock(s) and tag(s) shall notify the equipment owner/operator.

## III. PIPING SYSTEM LOCKOUT

### OWNER/OPERATOR RESPONSIBILITY

- A.) Identify all sources of energy. Identify locations and isolate sources by valve lockout; by insertion and lockout of pancake blanks; and/or by disconnect of pipe, installing, locking and tagging of blind flanges or plugs. When using chains for isolation of valves and other items, care must be use to keep the chain tight and restrict movement as much as practical.
- B.) Identify locations for potential trapped energy. Vent or otherwise clear these locations by valving open and locking; or by disconnecting lines.

This is the TRY step. It requires careful consideration of potential leaking valves, faulty pressure gages, potential plugging or the like.

**NOTE:** First Line Break or other written procedure is required for venting or clearing piping systems that do not have installed venting capability.

- C.) Automatically operated valves must not be used for personnel protection unless a locked blocking device, capable of withstanding full power, is employed. Locking power (electric/air) to an automatic valve is not acceptable. The blocking device must meet physical design criteria and be approved.

#### **INDIVIDUAL RESPONSIBILITY**

- A.) Each individual is responsible for understanding the source of energy, potential for stored energy, and locations of securing isolation and ensuring that the desired equipment has been properly secured and is ready to be work on. Each person may request evidence of the try step (venting or purging.) Disconnected line is in itself evidence of isolation of pressure source.
- B.) For Simple Lockouts, each individual performing work on the equipment must attach his personal lock and tag on the main disconnect and also must lock and tag the nearest start/stop device (if available). For System Lockouts, the individual must attach a personal lock and tag to the System lockbox.
- C.) Pancake blanks for isolation must meet specifications of Tunnel Maintenance. Blind flanges or plugs for isolation must meet appropriate piping specs for the pipeline.
- D.) If a possibility of contamination exists (toxic/corrosive) in equipment removed, an information tag shall be attached explaining hazard before sending equipment to another location.
- E.) When the work is complete, the last individual to remove their lock(s) or tag(s) shall notify the equipment owner/operator.

#### **IV. RETURNING EQUIPMENT TO SERVICE**

##### **OWNER/OPERATOR RESPONSIBILITY**

- A.) Verify that work is complete by proper communication and physical field checks.

- B.) Verify that no tags remain. If a work group had left the site without removing their tags, the following steps will be taken to remove the tag:
1. Owner/operator supervision establishes that the work group is off campus.
  2. Attempts are made to contact the work group at home for verbal approval to remove the tag.
  3. In failure of 2 above, the owner/operator's supervision must make contact with the work group's supervision for approval to remove the tag.
  4. The tag is then removed.
  5. The work group's supervision notifies the group that their tag has been removed as soon as they arrive on campus for their next shift of work.
- C.) Verify that all personal locks and tags have been removed. When a danger tag is removed the employee's name and date should be erased from the tag at that time. If an individual has left campus without removing their locks, the following steps will be taken to remove the personal lock:
1. Owner/operator supervision establishes that the individual is off campus.
  1. Attempts are made to contact the individual at home for verbal permission to remove their lock.
  2. In failure of 2 above, the owner/operator's supervision must make contact with the individual's supervision for approval to remove the individual's lock.
  3. The individual's lock is then removed.
  4. The individual's supervision notifies the individual that their lock has been removed as soon as they arrive on campus for their next shift of work.
- D.) Insure that all valving is properly aligned and all drain/vent valves are in proper position.
- E.) Perform any leak checks as required.

- F.) The owner/operator will then remove the Shop or System locks and tags from the energy source(s) with the exception of the last start/stop devices. (Refer to the lockout checklist or operational directions)
- G.) Have a qualified individual reinstall fuses in the electrical disconnect if removed.
- H.) Wearing the proper electrical PPE, turn on the electrical disconnect using proper body position.
- I.) The owner/operator will then remove the shop or system lock and tag from the start/stop device.

### **SECTION 3: PERIODIC INSPECTION OF THE ENERGY CONTROL PROCEDURE**

The Lockout/Tagout Committee comprised of campus personnel who are very knowledgeable and familiar with the requirements of this procedure and OSHA regulations will conduct an audit at least annually. This audit will consist of one or more lockouts being used in the area and an interview with one or more employees involved in those lockouts. The results of the audit will be documented and shared with area supervision in order to correct inadequacies/deviations in a timely manner.

### **CHANGING LIGHT BULBS**

Changing lamps or bulbs requires that the individual be qualified and experienced in recognizing electrical hazards. The bulbs may be replaced by such individuals with the power on or turned off at the wall switch, whichever provides the individual with adequate lighting. The minimum protective equipment required for lamp and bulb changing is safety glasses with side shields and if possible, leather gloves.

If a lamp or bulb is physically broken, the circuit shall be de-energized and locked out in accordance with this procedure to remove the fragments and electrical connectors. Fixture washdown and lamp cleaning using water will require light fixtures to be locked out. In addition, any lamp or bulb replacements in electrically classified areas will require lock out.

Low voltage (30 volts or less) bulbs in control panels and graphics can be changed by anyone trained to do so.

**OHIO UNIVERSITY**  
**LOCKOUT CHECKLIST**

**Date:** \_\_\_/\_\_\_/\_\_\_                      **Conducted By:** \_\_\_\_\_

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

**Building:** \_\_\_\_\_                      **Room:** \_\_\_\_\_

**Equipment Name:** \_\_\_\_\_

**Model:** \_\_\_\_\_                      **Serial Number:** \_\_\_\_\_

<b>Energy Source/*Magnitude</b>	<b>Location of Isolating Device</b>	<b>Means of Isolation</b>
<b>ELECTRICAL</b>		
<b>ENGINE</b>		
<b>SPRING</b>		
<b>COUNTER WEIGHT</b>		
<b>FLYWHEEL</b>		
<b>HYDRAUALIC</b>		
<b>PNEUMATIC</b>		
<b>CHEMICAL</b>		
<b>THERMAL</b>		
<b>OTHER</b>		

\*MAGNITUDE EXAMPLE- Electrical = 480v three phase  
Pneumatic = 125 PSI

All sources of energy must be identified. Follow the Lockout Procedure and always remember to test before touching the equipment.