

PURPOSE

To establish and define the procedures to prevent accidental and/or unauthorized use of equipment and to protect against unexpected energization/start up, or the release of stored energy, which could cause injury to an employee or damage to a piece of equipment. Furthermore, this procedure will define specific requirements for lockout/tagout in accordance with OSHA Regulations (29 CFR Part 1910.147).

REFERENCES

- OSHA Regulations, 29 CFR Part 1910.147.
- ANSI B11.TR3, Risk Assessment and Risk Reduction – A guide to Estimate, Evaluate and Reduce Risks Associated with Machine Tools.
- Exhibit 2 – Risk Estimation Information
- Exhibit 3 – Sample Warning Labels

RESPONSIBILITIES

Departmental Management is responsible for implementing, maintaining, and auditing the requirements of this procedure and ensuring that all affected and authorized personnel are trained in the requirements of this procedure. Additionally, they must ensure that outside contractors who are required to work within an area where this procedure is in effect comply with the procedure.

Authorized employees must follow these procedures as written.

Affected employees must understand the requirements of this procedure and ensure never to utilize equipment that is tagged or locked out. All affected employees whose job may require the use of locks and tags must be trained in this procedure prior to becoming an authorized employee.

DEFINITIONS

1. **Alternative Safety Measures:** Authorized safety and or shutdown measures used in lieu of lockout/tagout by employees during normal or routine or repetitive tasks. All alternative safety measures must under go the ANSI Z244.1 Risk Assessment process prior to implementation.
2. **Authorized Employees:** Any employee whose job may require the use, cleaning, or maintenance of equipment in which the uses of lockout/tagout devices are required.
3. **Affected Employees:** Any employee who will be working within an area where such lockout/tagout devices are used. All plant employees are considered affected employees.

APPLICATIONS

The steps described in this procedure must be followed to control hazardous energy sources during set-up, cleaning, servicing and/or maintenance of any machine or other type of equipment when lockout is feasible.

THIS PROCEDURE DOES NOT APPLY TO:

- Work performed on cord and plug applications where the disconnected cord or plug would prevent unexpected start-up or energization of the equipment when disconnected from the energy source **AND** the cord or plug is under exclusive control of the employee performing the service or maintenance, or
- When equipment is under exclusive control of the operator.
- Normal production operations including tool changes, adjustments and equipment servicing that are considered minor, routine, repetitive, integral to the use of equipment and take place during the normal production operation, (provided the work is performed using alternate protection) **UNLESS:**
 - A.** An employee removes, alters or bypasses a guard switch or other safety device (unless the employee is employing alternate safety measures described in section E of this SOP
 - B.** An employee places any part of his/her body into an area (on a machine or any other type of equipment):
 1. Where work is being performed.
 2. Where there are moving parts.
 3. Where material is being processed.
 4. That may be considered as a danger zone during the operating cycle.

The types of stored energy hazards covered by this procedure include, but are not limited to: electricity (i.e. 120V, 208V, 220V, etc.); compressed air (i.e. @ 120 PSI); and pressurized fluid lines (i.e. hydraulic lines).

PROCEDURE

RESPONSIBILITY

Facilities Department / Site
Specific Personnel

ACTION

A. PREPARATION FOR IMPLEMENTING LOCKOUT / TAGOUT PROCEDURES

1. IDENTIFICATION

- a. All equipment, which is covered by this procedure, should be identified with a “LOCK OUT BEFORE SERVICING” label (see **Exhibit 3**) or other approved means of identification. An equipment lockout/tagout data sheet (See **REF-37**) describing the type of equipment (number), location (where applicable), energy sources, lockout device and lockout point location etc. should be filled out for all identified equipment.

2. SPECIFIC ENERGY CONTROL PROCEDURE

PROCEDURE

RESPONSIBILITY

Facilities Department /
Department Management

ACTION

A specific equipment energy control procedure must be developed for all identified equipment. This procedure describes in detail the step-by-step method for locking/tagging out that particular piece of equipment. This procedure needs to be posted on the equipment and/or must be placed in the lockout procedure manual/binder and included in the specific Equipment. This manual/binder should be located in a designated Lockout/Tagout Safety Center (i.e. MFG workstation)

3. LOCKOUT/TAGOUT SAFETY CENTER

Facilities Department /
Equipment Validator /
Department Management

Location(s) in each production area should be established and maintained as a Lockout/Tagout Safety Center. This area should contain the necessary lockout/tagout devices as well as other materials required for compliance with this procedure. Other items located here may include:

- Equipment Energy Control Procedures
- Equipment Data Sheets
- Logbook for employees locks and tags
- Copy of OSHA 29 CFR Part 1910.147
- Material Safety Data Sheets (MSDS)
- Other Safety Related Items

4. RECORD KEEPING

PROCEDURE

RESPONSIBILITY

ACTION

Authorized Employee/
Departmental Management

- a. Each time a piece of equipment is locked or tagged out, the authorized employees' initials and date must be on the lockout/tagout device. In addition, only authorized employees will be issued locks/tags and departmental management must maintain a list of such employees. If needed, a logbook may be used to "issue and return" locks to further limit their access. Should a logbook be utilized, the departmental management will be responsible for ensuring it is properly and inspected periodically for completeness.

Authorized Employee/
Departmental Management

- b. Each time a piece of equipment is cleaned, set-up/operated, serviced, repaired, etc. an entry into the equipment logbook or separate lockout/tagout logbook is required. Any time lockout / tagout is performed, then the applicable logbook should include an entry for the lockout/tagout including the following information:
 - Reason for Lockout
 - Method Used
 - Signature
 - Time and Date Equipment taken off line
 - Time and Date Equipment put on line

PROCEDURE

RESPONSIBILITY

ACTION

Authorized Employee/
Departmental Management

1. NOTIFICATION

Notify all affected employees that the lockout/tagout system is going to be utilized.

2. PREPARATION

In preparation for locking/tagging out any equipment, you may refer to the Equipment Energy Control Procedures Manual/Binder and Equipment Data Sheets for specific information types and sources of hazardous energy.

B. PERFORMING LOCKING AND TAGING OUT PROCEDURES CONT'D

Authorized Employee/
Departmental Management

NOTE: If a specific energy control procedure is not available, survey the equipment with the Department Supervisor or designated Safety Coordinator to locate and identify all isolating devices (valves, switches, etc.) that apply to the equipment to be locked or tagged out. Also, refer to the equipment manual(s) and operating instructions for further information in isolating the energy sources.

Departmental Management

NOTE: An Energy Control Procedure should then be created for that piece of equipment.

Authorized Employee/
Departmental Management

3. SHUTDOWN

If the equipment is operating shut it down by the normal stopping procedure as outlined in the appropriate equipment SOP.

4. ENERGY DISSIPATION

Operate the switch, valve or other energy isolating device(s) so that the equipment is isolated from its energy source(s). Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.

PROCEDURE – CONT'D

RESPONSIBILITY

Authorized Employee/
Departmental Management

Authorized Maintenance
Employee

ACTION

5. NON ELECTRICAL HAZARDS

Isolation of non-electrical energy sources require special handling (Contact your Department Supervisor/Team Leader for instructions when encountering these sources):

- Lock out other energy sources such as hydraulic power using the correct procedure (Refer to the manufacturer's manual).
- Release of pressures associated with these power sources will require special consideration.
- The build up of stored or residual energy is common with these sources of power. Special precautions are required.
- Stop blocks or safety rods may also be required.

6. ELECTRICAL HAZARDS

Live parts that an employee may be exposed to shall be put into an electrically safe work condition before an employee works on or near them. . An electrically safe work condition is achieved when performed in accordance with the following:

- a. Determine all possible sources of electrical supply to the equipment and disconnect the current using the appropriate device.
- b. Verify that all disconnecting devices have been disengaged and apply lock out devices where necessary.
- c. Test each phase conductor or circuit (both phase to phase and phase to ground) with an adequately rated voltage detector to verify that they are de-energized.

PROCEDURE – CONT'D

RESPONSIBILITY

Authorized Maintenance
Employee

ACTION

6. ELECTRICAL HAZARDS – CONT'D

- d. Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them.

NOTE: The individual qualified employee control procedure shall be permitted when equipment with exposed conductors and circuit parts is de-energized for minor maintenance, servicing, adjusting, cleaning, inspection, operating conditions, etc. The work shall be permitted to be performed without the placement of lockout/tagout devices on the disconnecting means, provided the disconnecting means is adjacent to the conductor, circuit parts, and equipment on which the work is performed, the disconnecting means is clearly visible to the individual qualified employee involved in the work, and the work does not extend beyond one shift.

NOTE: All lockout/tagout procedures that involve only a qualified person(s) de-energizing one set of conductors or circuit part source for the sole purpose of performing work on or near electrical equipment shall be considered to be a simple lockout/tagout. Simple lockout/tagout plans shall not be required to be written for each application.

- e. If a lockout needs to be performed and it does not meet the requirements of a simple lock out/tagout, a written procedure must be implemented. This procedure must include the proper voltage detector, the boundary of the work area, and a requirement to test every exposed conductor in the work area boundary.

PROCEDURE – CONT'D

RESPONSIBILITY

Authorized Employee/
Departmental Management

ACTION

7. INSTALLATION OF LOCKOUT/TAGOUT DEVICES

- a. Follow record keeping procedures outlined in Section A step 4 of “Preparation for Implementing Lockout/Tagout Procedures”.
- b. **LOCKING** - Lockout the energy isolating devices with assigned individual lock(s).

NOTE: If for any reason a piece of equipment’s hazardous energy source(s) cannot be locked out (i.e. no switches or power is needed to jog machine), it must be tagged out accordingly.

- c. **TAGGING** - If the equipment was locked out, attach the tag that reads “LOCKED OUT” and “DO NOT OPERATE” in the same location. (**Exhibit 3** for an example)

NOTE: If the equipment is only to be tagged out attach the tag using a non-reusable cable tie instead of lock. The tag should read, “TAGGED OUT” and “DO NOT OPERATE”. (See **EXHIBIT 3** for an example)

NOTE: If the piece of equipment being locked and/or tagged out will need to remain so through additional working shifts; the authorized employees lock and/or tag must remain on the piece of equipment. If the piece of equipment will be needed for the next shift and the servicing, cleaning, etc., has not been completed then the authorized employee must notify the next shift of the situation and have the appropriate authorized employee on that shift place his/her lock and/or tag on the piece of equipment, and remove the original device.

PROCEDURE – CONT'D

RESPONSIBILITY

Authorized Employee/
Departmental Management

ACTION

8. MULTIPLE LOCKOUTS

If more than one individual is required to lockout or tagout equipment, each individual shall place his/her own personal lockout device or tagout device on the energy isolating device(s). When an energy-isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (HASP) may be used. Each employee will then use his/her own lock to secure the energy-isolating device. As each person no longer needs to maintain his/her lockout protection, that person will remove his/her lock from the HASP.

9. CHECK

After ensuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.

NOTE: CAUTION: RETURN OPERATING CONTROL (S) TO “NEUTRAL” OR “OFF” POSITION AFTER THE TEST.

10. COMPLETION

Once the equipment is locked out or tagged out, do not attempt to operate the equipment while performing necessary cleaning, maintenance, etc.

NOTE: When equipment that is locked/tagged out needs to be jogged, re-positioned etc, it can be done as long as the following is completed: the equipment is cleared of personnel, tools and equipment; the lockout devices are removed and the equipment re-positioned as necessary to continue servicing, cleaning etc. The lockouts are re-applied prior to placing any body parts or tools in a potential danger zone.

RESPONSIBILITY

Authorized Employee/
Departmental Management

Authorized Employee/ Departmental
Management

ACTION

C. RESTORING EQUIPMENT TO NORMAL PRODUCTION OPERATIONS

1. CHECK

After cleaning, maintenance, etc. is complete and equipment is ready for normal production operations, check the area around the equipment to ensure that no one is exposed.

2. REMOVAL OF LOCKOUT/TAGOUT DEVICE

After all tools have been removed from the equipment, guards have been reinstalled and employees are in the clear, remove all lockout or tag devices. Each individual is responsible for removing only his/her lock and/or tag.

3. NOTIFICATION

Notify all affected area employees that the lockout/tagout protection has been removed. Operate the energy isolating devices to restore energy to the equipment.

4. COMPLETION

Return all energy isolating devices to the appropriate Lockout/Tagout Safety Center. Be sure to remove all information from tags before returning. Complete any record keeping as outlined in step 4 of "Preparation for Implementing Lockout/Tagout Procedures".

NOTE: If a condition arises where the individual who locked/tagged out the equipment is unavailable when the time comes to remove the lock/tag, then only the Departmental Management has the authority to remove the device(s). Prior to the removal, a check should be performed to ensure that all safety/compliance concerns are addressed. The Departmental Management must follow the same sequence of steps outlined above prior to the removal of the tag and/or lock. The individual's lock and/or tag will be held and the individual notified upon his/her return of the actions, which took place.

D. TESTING OR POSITIONING OF MACHINES, EQUIPMENT, OR COMPONENTS THEREOF

Facilities Department / Department Management / Authorized Employee

1. Alternative safety measures must be used when servicing equipment, which, by their very nature, must take place without de-energization or lock out/tag out. (Such as operational testing or positioning of machines or equipment). For all other equipment do the following:
 - a. Clear the machine or equipment of tools and materials that are non-essential.
 - b. Ensure that machine or equipment components are operationally intact.

PROCEDURE – CONT'D

RESPONSIBILITY

ACTION

D. TESTING OR POSITIONING OF MACHINES, EQUIPMENT, OR COMPONENTS THEREOF – CONT'D

Facilities Department / Department Management / Authorized Employee

- c. The work area shall be checked to ensure that all employees are safely positioned or removed. (i.e. No part of the employee's body may enter into the danger zone of the equipment at any time)
 - d. If a lockout device has been applied, it must be removed by the employee who applied the device.
 - e. Energize and proceed with testing or positioning.
 - f. Deenergize all systems and reapply energy control measures.
2. In the event that a bypass of a safety interlock or the removal of a guard be required for testing purposes by a maintenance person, vendor or equipment validator, the following events shall take place.
 - a. Inspect all moving parts and connect members associated with the test are properly secured from being dislodged on start up.
 - b. Inspect the area around the moving parts that no miscellaneous connecting parts (screws, nuts, bolts, etc.) are in the vicinity.
 - c. Enter a description of the safety interlock bypass in the lockout / tagout logbook.

- d. Record the name of the individual performing the event.
- e. Record the time and date of the event.
- f. Record the signature or initials of the person performing the event.

PROCEDURE – CONT'D

RESPONSIBILITY

Facilities Department / Department Management / Authorized Employee

ACTION

D. TESTING OR POSITIONING OF MACHINES, EQUIPMENT, OR COMPONENTS THEREOF – CONT'D

- g. The operator of the equipment, if present, will be asked to leave the room or area prior to starting of the equipment.
- h. Post a sign indicating that equipment is being tested and the area is restricted to authorized personnel on the door to the room or adjacent wall to the area.
- i. No part of the employee's body may enter into the danger zone of the equipment at any time.
- j. The safety will be bypassed or guard removed.
- k. The individual who will be performing the test will remove the lockout/tagout device.
- l. Perform the test.
- m. Lock and Tag out the equipment at the conclusion of the test.
- n. Restore the safety interlock or guard.
- o. Record the time and date that the event was concluded.
- p. Record the signature or initials of the person completing the event.
- q. Remove the warning sign permitting entry into the room or area.

RESPONSIBILITY

ACTION

E. ALTERNATIVE MEASURES FOR ROUTINE, REPETITIVE AND INTEGRAL TASKS

Department Management /
Engineering/ Health & Safety/
Authorized Employee

1. Lock out/tag out is the primary method of hazardous energy control. When tasks are routine, repetitive and integral to the production process, or lock out/tag out prohibits these integral tasks from being completed, alternative methods are acceptable provided that a risk assessment is used. (See Exhibit 1 for a flowchart, and for the documentation form and example risk assessment), all others should adhere to the following:
2. The risk assessment shall include the following:
 - a. Identification of the tasks (including foreseeable misuse) and related hazards.
 - b. Qualitative estimation of exposure and severity to determine the level of risk.
 - c. Assessment and evaluation of the risk
 - d. Identification of potential control actions considered to reduce the risk of each hazard
 - e. Identification of control actions selected as the best protective alternative
 - f. Verification of the effectiveness of the selected alternative

F. TRAINING

Departmental Management

1. Train all authorized and affected employees at least annually on their responsibilities under this procedure. Training should include a review of all applicable equipment specific energy isolating procedures including the applicable type and magnitude of hazardous energy sources. In addition, the training should emphasize the limitation of tags as opposed to locks.
2. Provide training whenever there is a new hazard introduced into the area, an employee changes job assignments, or there are changes in energy isolation procedure.

Departmental Management
/Environmental, Health & Safety
Personnel / Site Specific Personnel

NOTE: The Environmental Health and Safety Section of the Facilities Dept. may also assist in this training.

G. PERIODIC AUDITS

Departmental Management

1. Ensure annual audits are performed on the equipment specific procedures, locks and tags being utilized throughout the production areas. Authorized personnel who do not normally work on the equipment being audited must perform audits. A written certification documenting that the audit was performed should be completed. Copies of the certification should be maintained with Departmental Management. If any defective devices are found, they must be removed from service immediately.
2. In addition, ensure the appropriate locks and tags are available and any logs utilized for their distribution are complete and up to date.

Departmental Management /
Environmental, Health & Safety
Personnel / Site Specific Personnel

NOTE: The Health and Safety Section of the Human Resources Department may also assist in these inspections.

EXHIBIT 2. RISK ESTIMATION INFORMATION

Probability of Occurrence of Harm	Catastrophic	Serious	Moderate	Minor
Very Likely	High	High	High	Medium
Likely	High	High	Medium	Low
Unlikely	Medium	Medium	Low	Negligible
Remote	Low	Low	Negligible	Negligible

Severity of Harm

Catastrophic – Death or permanently disabling injury or illness (unable to return to work)

Serious – Severe debilitating injury or illness (able to return to work at some point)

Moderate – Significant injury or illness requiring more than first aid (able to return to same job)

Minor – No injury or slight injury requiring no more than first aid (little or no lost work time)

Probability of Occurrence of harm

Very likely – Near certain to occur

Likely – May occur

Unlikely – Not likely to occur

Remote – So unlikely as to be near zero

NOTE: The highest credible probability and severity is to be selected and the following are factors to be considered for estimating probability:

Exposure to the hazard (Frequency, duration and extent)

Personnel who perform tasks

Machine/task history

Workplace environment

Human factors

Reliability of safety functions

Possibility to defeat or circumvent protective measures

Ability to maintain protective measures

EXHIBIT 3.

