



UMBC OFFICE OF ENVIRONMENTAL SAFETY AND HEALTH (ESH) WRITTEN PLAN	TITLE: Lockout Tagout Program
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I. PURPOSE

To protect employees from machines and equipment capable of causing injury due to unexpected energization, release of stored energy or the start-up of equipment while an employee is performing maintenance or servicing equipment.

This program shall serve as the primary Hazardous Energy Control Plan for University of Maryland, Baltimore County (UMBC), in compliance with the requirements of OSHA 1910.147 – Control of Hazardous Energy (Lockout Tagout) standard.

II. SCOPE

The Lockout Tagout Program applies to all UMBC employees who perform service or maintenance on equipment where there is a potential for harm due to hazardous energy, as well as employees who perform work on or around equipment that has been locked and tagged out for service or maintenance.

III. DEFINITIONS

- *Affected employee* – An employee who is required in the performance of their job to operate equipment or machinery under which servicing or maintenance is being performed, and whose job requires them to work in an area where locked or tagged out equipment is being serviced.
- *Authorized employee* – An employee who performs the act of locking or tagging out machinery or equipment to perform service, inspection, or maintenance.
- *Energy Source*- Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
- *Lockout*- The placement of a lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

- *Lockout Device*- A device that utilizes a positive means, such as a lock, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or piece of equipment.
- *Normal Production Operations*- The utilization of a machine or piece of equipment to perform its intended production function.
- *Primary Authorized Employee*- The authorized employee who has been vested with responsibility for a set number or group of employees performing service or maintenance on machines or equipment subject to lockout or tagout procedures.
- *Qualified person (electrical)*- one who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.
- *Servicing and/or Maintenance*- Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or un-jamming of machines or equipment, and making adjustments or tool changes where the employee may be exposed to the unexpected energizing, start-up of the equipment, or release of hazardous energy.
- *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.

IV. PROCEDURE

Lockout tagout refers to the set of procedures and work practices that pertain to the de-energizing and securing of equipment or machinery so that hazardous energy is not re-introduced while equipment and machinery is in the process of being maintained, inspected, or serviced.

Hazardous energy can present itself in several forms, including:

- Mechanical
- Electrical
- Hydraulic
- Pneumatic
- Chemical
- Radioactive
- Thermal

Following the appropriate Lockout Tagout procedures will ensure that equipment will not be inadvertently activated while it is being serviced, as well as ensure that workers in the area who are at risk of encountering such equipment are protected.

General Requirements

- Only authorized, appropriately trained employees are permitted to apply a lockout/tagout device.
- Authorized employees may only remove a lockout/tagout device that they installed themselves.
- All affected employees shall be notified prior to application and removal of any lockout/tagout device.
- Authorized employees must follow the procedure as outlined in this procedure for applying and removing lockout/tagout devices, in addition to any applicable equipment or machinery-specific procedures.
- Electrically energized equipment must be tested and verified as zero energy/absence of voltage by a qualified person with appropriate electrical knowledge and training.
- No person shall attempt to operate equipment that is locked/tagged out.
- Personnel shall stop work and immediately report to department supervision and Environmental Safety and Health, any unsafe conditions or unexpected situations that arise while performing service or maintenance on de-energized equipment.

Exceptions to Lockout Tagout Requirements

Cord and Plug

Servicing of equipment that is energized by cord-and-plug does not require lockout tagout procedures under the following conditions:

- The equipment is completely de-energized through the unplugging of the equipment and does not have another means of re-energizing.
- The plug is kept under exclusive control of the authorized employee performing the service activity.

Minor Service

Lockout tagout is not required for performing minor service during normal production operations. The following conditions must be met for this exception:

- The activity must be conducted during normal production operations, (while the machine or equipment is actually performing its intended production function).
- The activity must be:
 - *Routine*: The activity must be a regular course of procedure and be in accordance with established practices.
 - *Repetitive*: The activity must be regularly repeated as part of the production process.
 - *Integral*: The activity must be essential to the production process.

- Alternative measures must be utilized to provide effective protection from the hazardous energy.
 - Examples of acceptable alternative measures include specially designed tools, remote devices, interlocked barrier guards, local disconnects, or control switches which are under the exclusive control of the employee performing the minor servicing.

Six Step Lockout/Tagout Procedure

This is the general procedure to be followed when performing any lockout tagout operation, in addition to any machine or equipment-specific procedures as applicable.

Step 1: Prepare for Shutdown

The authorized employee shall investigate and identify all sources of energy utilized by the equipment to be serviced, to understand how to effectively disconnect or eliminate such sources.

Step 2: Shut Down

Power down the equipment to be serviced and notify all employees that will be affected by the shutdown. This includes equipment operators and any other employees that will be working in the area.

Step 3: Isolate

Isolate the machine or equipment to be serviced from all identified energy sources. Typically, this is achieved by actions such as closing valves, flipping circuits, or disengaging lines.

Step 4: Lockout/Tagout Application

The authorized employee attaches a lock and tag to each energy-isolating device once the device(s) is in a safe or off position. The lock must prevent the device from being able to be reengaged, reconnected, switched on, or placed into an otherwise activated position.

A tag shall then be placed in the same point or as close as safely possible to the lockout device so that it is clearly visible to affected employees. The tag must contain the warning messaging “DANGER: DO NOT OPERATE” or “DANGER: LOCKED OUT” or similar language. The tag must also contain, at a minimum, the name of the authorized person who applied the lock and tag and their contact information.

Step 5: Stored/Residual Energy Check

The authorized employee checks for stored or residual energy remaining in the equipment. Any energy should be relieved, released, restrained, discharged, or otherwise freed from the equipment.

Step 6: Isolation Verification

The authorized employee will verify that the equipment is fully isolated and de-energized from all energy sources to confirm it is safe to begin work.

Lockout/Tagout Removal and Returning Equipment to Service

The following steps shall be taken to ensure safe removal of lockout/tagout devices and restoration of energy to the serviced equipment, following the completion of work:

- The authorized employee(s) will perform a full inspection of the work area and equipment to ensure all equipment components are intact and ready to resume operation.
- The authorized employee(s) shall inform all affected employees that lockout/tagout devices will be removed and energy will be restored to the equipment.
- Affected employees and department leadership will be notified once equipment has been fully re-energized and normal operations may resume.

Machinery or Equipment-Specific Lockout Tagout Procedures

Departments shall be responsible for developing and maintaining written lockout tagout procedures for equipment and machinery at UMBC over which the department maintains authority.

The procedure shall contain the following information:

- Instructions for using the procedure.
- Specific procedural steps for shutting down, isolating, and securing the machinery or equipment.
- Specific procedural steps for the placement of lockout tagout devices.
- Names of employees who have responsibility for the lockout tagout devices.
- Specific procedural steps for ensuring the effectiveness of the lockout tagout devices.

Similar Machines and Equipment

Similar machines and equipment (those using the same type and magnitude of energy), which have the same or similar type of controls, can be covered with a single procedure, and do not require a procedure for each machine or equipment.

Exemptions from Written Procedures

Lockout tagout must still be followed, but a written procedure is not required if the machine or equipment meets all of the following criteria:

- The machine or equipment has no potential stored or residual energy, and energy may not re-accumulate after shutdown.

- There is a single energy source that can easily be identified and isolated.
- The lockout will completely de-energize the equipment.
- The equipment is isolated and locked out from the energy source during maintenance.
- A single lockout device will achieve the required isolation.
- The lockout device is under the exclusive control of the authorized employee performing the work.
- The work does not create hazards for other employees.
- Previous use of this exemption has not caused accidents involving unexpected re-energization or startup.

This exemption typically applies to portable and plug and play equipment such as office equipment, fans, power tools, and other equipment with a single isolation point, or power cord.

Special Lockout/Tagout Situations

Tagout Only:

- Tagging out equipment without a lock is only permitted in circumstances where the energy-isolating device is not physically capable of accepting a lockout device or the lockout device would not be effective in preventing the re-energizing of the equipment.
- Tagout-only applications must involve the prior notification and approval of department supervision.
- All steps in the Six Step Lockout/Tagout Procedure must still be followed except for the section of Step Four pertaining to applying a lockout device.

Shift Changes:

If the servicing of locked out equipment extends beyond the authorized employee's shift, the following steps must be taken to ensure the orderly transfer of responsibility and to prevent inadvertent start up or energizing of the equipment:

- Off-going personnel coordinates with on-going personnel and briefs them on all pertinent information relating to the work being performed.
- Once on-coming personnel have been fully briefed and are ready to begin work, the off-going personnel will remove their lockout/tagout device(s) from the equipment.
- The on-coming personnel will then immediately apply their lockout-tagout device(s) to the equipment.

Lockout/Tagout devices should not be left on beyond the scheduled work shift of the authorized employee who applied the device except in critically necessary circumstances, and requires the prior notification and approval of department supervision.

Group Lockout/Tagout Procedure:

When servicing or maintenance of energized equipment involves multiple people, or multiple parties, such as UMBC employees and outside contractors, the following steps shall be taken:

- Department management shall designate a primary authorized employee as having overall responsibility for the control of hazardous energy for the group for the duration of the work to be completed, and for ensuring all appropriate lockout/tagout steps are taken for the duration of the work.
 - For group lockout tagout involving both UMBC and a contractor, the primary authorized employee shall be a UMBC authorized employee, who shall maintain sole authorization to apply or remove the group lockout device unless under the approval and observation of department management.
- The primary authorized employee will attach a group lockout tagout device, such as a lock box, to the energy isolating device.
- Each authorized employee in the group will then attach a personal lockout/tagout device to the multiple lock accepting device.
- Following completion of work, each authorized employee in the group will remove their personal device from the multiple lock accepting device.
- The primary authorized employee will then remove the multiple lock accepting device from the energy isolating devices.
- No one other than the primary authorized employee shall be permitted to remove the group lockout device unless under the express approval and observation of UMBC department management.

Contractor Work

Contractors who perform service or maintenance on UMBC equipment where there is potential for harmful exposure to hazardous energy are required to adhere to all requirements of the Lockout Tagout Program in addition to any requirements of the contractor's lockout/tagout program.

Contractors may not perform any lockout/tagout operation at UMBC without prior knowledge and approval from the department or area that has authority over the equipment or machinery to be locked out/tagged out. The department shall maintain communication and coordination with the contractor during all stages of the service or maintenance being performed until work has completed and normal operations have resumed.

Contractors shall also be required to review and adhere to any applicable machine or equipment-specific lockout tagout procedures when performing any service, maintenance, or repairs to equipment under lockout tagout conditions.

Lockout Tagout Training

Initial training shall be required for both authorized and affected employees prior to beginning work under lockout tagout conditions.

Authorized Employee training shall cover the following topics:

- Requirements under OSHA 1910.147 Control of Hazardous Energy standard.
- How to use proper lockout tagout procedures.
- Recognition of hazardous energy sources.
- Details about the type and magnitude of the hazardous energy sources present in the work area.
- Methods and means necessary to isolate and control hazardous energy sources, including lock and tag application and removal.
- How to recognize and handle special lockout tagout situations.
- Limitations of tagout-only application.

Affected employee training shall consist of the following, at a minimum:

- How to recognize when lockout/tagout or energy control procedures are in use.
- Purpose of lockout/tagout energy control procedures.
- Understanding that it is prohibited to start or operate equipment that has been locked or tagged out for servicing.

Periodic Inspections

Periodic inspections of lockout tagout procedures shall be conducted on at least an annual basis. The purpose of the periodic inspection is to ensure:

- Lockout tagout procedures are being followed
- Authorized employees understand their responsibilities
- Lockout tagout procedures are effective and adequate to protect employees.

Departments shall designate an authorized employee to facilitate periodic inspections. The authorized employee must be someone other than the authorized employee implementing the lockout tagout procedure being inspected, and must have knowledge of the equipment and the appropriate lockout tagout methods.

The inspector shall perform the following steps:

- Observe an authorized employee implementing the lockout tagout procedure for the servicing or maintenance activities being evaluated.
- If necessary, update or revise any departmental or equipment/machinery specific lockout tagout procedures based on the findings of the inspection.
- Review and discuss the department and equipment/machinery specific procedures, and any changes made to those procedures, with all other authorized employees who did not implement the procedure during the inspection, to ensure authorized employees (and affected employees, if applicable) understand their responsibilities under the lockout/tagout procedure being inspected.
 - This may be accomplished by having a meeting in which all authorized employees (and affected employees, if applicable), will be in attendance to review the specific lockout/tagout procedure.
 - If the procedure involves a tagout-only operation, then affected employees must also be included in the review.
- Submit documented periodic inspections to department supervision for review and approval.

Environmental Safety and Health will additionally perform periodic review of the Lockout Tagout Program and department lockout tagout procedures and inspections to ensure continued safety, effectiveness, and compliance.

Retraining Requirements

In addition to initial training and periodic inspections, both authorized and affected employees shall complete continuing awareness level training on an annual basis. This can be completed in a classroom or computer-based setting.

Additional conditions that require retraining:

- Following any incident or near-miss.
- Changes in workplace or equipment conditions render current hazardous energy control procedures ineffective or no longer accurate.
- An authorized or affected employee demonstrates a deficient knowledge or understanding of training.
- An authorized employee fails to properly demonstrate an appropriate lockout tagout operation during a periodic inspection.

Recordkeeping

Departments shall be responsible for maintaining:

- Records of training received for authorized and affected employees.
- Records of periodic inspections of department lockout tagout procedures.

- Current revisions of lockout tagout procedures for specific machinery or equipment.
- A current list of authorized employees in their department or area.
- Records of service, such as maintenance or repairs, for equipment or machinery over which they have authority that required lockout tagout for such servicing.

Unless otherwise specified, all documents and records shall be retained for a period of three (3) years.

V. ROLES AND RESPONSIBILITIES

Department/Area Managers, Deans, Administrators

- Ensure authorized and affected employees review, understand, and adhere to the requirements of the Lockout Tagout Program.
- Develop and maintain department-specific or machine/equipment-specific lockout tagout procedures as required.
- Ensure authorized and affected employees complete required lockout tagout training.
- Ensure authorized employees have the appropriate tools and equipment to safely perform lockout tagout operations.
- Participate in annual reviews and inspections of Lockout Tagout Program.
- Report any safety concerns or hazards to Environmental Safety and Health.

Authorized Employees

- Adhere to all requirements of the Lockout Tagout Program and other applicable procedures when performing Lockout Tagout operations, or when working in the vicinity of equipment that is locked and tagged out.
- Ensure all necessary training is completed prior to performing a lockout tagout operation or performing any work on or near equipment that is locked/tagged out.
- Ensure all necessary tools, equipment, and personal protective equipment are available to safely perform work.
- Participate in the Lockout Tagout Program periodic inspections.
- Stop work and promptly report any unsafe conditions, safety concerns, or unexpected circumstances to supervision and Environmental Safety and Health.

Affected Employees

- Adhere to the requirements of this procedure.
- Complete all required training to maintain awareness of lockout tagout procedures as it relates to affected employees.

- Do not operate or attempt to restart equipment or machinery that is locked or tagged out for service.
- Report any unsafe conditions, safety concerns, incidents, or near-misses to supervision and Environmental Safety and Health.

Environmental Safety and Health

- Serve as administrator of the Lockout Tagout Program.
- Perform periodic review of the Lockout Tagout Program and department lockout tagout procedures and inspections to ensure continued safety, effectiveness, and compliance.
- Communicate any changes or updates made to the Lockout Tagout Program to affected departments.

VI. REFERENCES

- UMBC Policy VI-13.00.01 - Environmental Safety and Health Management and Enforcement
- UMBC ESH Procedure - General Safety Rules for UMBC Employees
- UMBC ESH Written Plan - Electrical Safety
- Lockout Tagout Annual Inspection Form
- Machine and Equipment-Specific Lockout Tagout Procedure