

UConn

LOCKOUT/TAGOUT PROGRAM

Environmental Health and Safety
3102 Horsebarn Hill Road, U-4097
Storrs, CT 06269
860-486-3613
ehs@uconn.edu

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Contact:	EHS Occupational Health and Safety 860-486-3613 ehs@uconn.edu

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Lockout/Tagout Program

1 BACKGROUND

This program applies to the servicing or maintenance of machines and equipment where the unexpected energization, start-up or release of stored energy could cause injury to employees. Examples of applicable energy sources include, but are not limited to, electrical, thermal, mechanical, hydraulic, pneumatic, and chemical. The program does not apply to:

1. Minor servicing activities taking place during normal operations that are routine, repetitive and integral to the use of the machine or equipment, provided that:
 - a. There is no bypass or removal of guards or other safety devices; and
 - b. Employees are not required to place any part of their bodies in a point of operation or other area where a danger exists.
2. Minor printing press servicing activities taking place during normal operations that are routine, repetitive and integral to usage which can be safely accomplished by employees provided that:
 - a. Extensive disassembly of equipment is not required to perform servicing.
 - b. Effective alternate protection measures are used which allow an employee to perform minor servicing without being exposed to the unexpected release of hazardous energy (i.e., using special tools or techniques such as the inch-safe- service technique).
3. Cord and plug connected electrical equipment that, when unplugged, contains no stored energy and cannot be unexpectedly energized. The plug must be under the exclusive control of the authorized employee working on the equipment.

Note: A plug is in exclusive control of an employee when it is physically in the line of sight of the employee.

4. Hot tap operations (e.g., welding a split tee fitting on a steam line) where the continuity of service is essential, a shutdown of the system is impractical, documented procedures are followed, and special equipment is used which provides proven effective protection for employees.

2 PURPOSE

Environmental Health and Safety (EHS) developed this program to safeguard University employees from serious injuries resulting from the unexpected release of hazardous energy while servicing machinery or equipment. As required by the Occupational Safety and Health Administration (OSHA) regulations The Control of Hazardous Energy (Lockout/Tagout) ([29 CFR 1910.147](#)) and the Selection and Use of Work Practices ([29 CFR 1910.333](#)), this policy contains the necessary elements of an energy control program, which includes documented lockout/tagout procedures, employee training, periodic inspections, work with contractors and the means to enforce compliance.

3 SCOPE

This program applies to all faculty, staff, and student employees at the Storrs and regional campuses, extension centers, and the School of Law, except UConn Health. It also applies to contractors, insofar as maintaining compliance with the OSHA standard and the University's Contractor Safety Manual, conducting work around UConn affected employees and conducting group and boundary lockout/tagouts with UConn staff. It does not apply to the Storrs campus Cogeneration plants which have their own lockout tagout program in accordance with the OSHA regulation Electric Power Generation, Transmission, and Distribution ([1910.269 \(d\)](#)).

4 POLICY STATEMENT

As stated in the University's [Health and Safety Policy](#), the University of Connecticut is committed to providing a healthful and safe environment for all activities under its jurisdiction and complying with federal and state regulations and other health and safety standards. Lockout/tagout procedures are a safety protocol internationally adopted by industry that involve physically locking and tagging out the energy sources of equipment to prevent the accidental startup or release of hazardous energy. Compliance with these procedures protects workers from potential injuries or fatalities caused by unexpected energization or the release of stored energy during equipment maintenance or repair operations.

5 ENFORCEMENT

Violations of this program may result in appropriate disciplinary measures, up to and including dismissal, in accordance with University Laws and By-Laws, [General Rules of Conduct](#), applicable collective bargaining agreements, and [The Student Code](#).

6 DEFINITIONS

Affected Employee: an employee whose job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires them to work in an area in which servicing or maintenance under lockout/tagout is being performed.

Authorized Employee: a person who locks out or tags out a machine or equipment 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 outlined in this program.

Boundary Lockout/Tagout: procedures that establish “energy isolation boundaries” usually between two UConn work groups, or between UConn and contractor work groups. They constitute a group lockout tagout between the two groups.

Caution Advisory Tag: a yellow tag with the word “CAUTION” printed boldly at the top. They are often used together with a shop lock to provide precautionary information to workers. This information can include why an energy isolating device is secured along with contact information of the person who secured it. It cannot be used for lockout/tagout purposes when persons are performing work on the equipment. Reasons for their usage include but are not limited to:

- Equipment out of service and waiting for parts.
- Equipment secured while awaiting the following shift’s use of lockout-tagout devices.
- Seasonal locking of energy isolating devices (heating or cooling seasons).
- Securing equipment when no work is currently being performed on it.

Energy Isolating Device: a mechanical device that physically prevents the transmission or release of energy. Examples include, but are not limited to, electrical circuit breakers, disconnect switches, line valves, blocks, or any similar device used to block or isolate energy.

Note: Push buttons, selector switches and other control circuit-type devices are not energy-isolating devices.

Group Lockout/Tagout: a modified system of lockout/tagout where one individual, knowledgeable of the equipment, performs a lockout/tagout on all the energy isolating devices

necessary and then secures the lockout keys in the lock box. Then, each worker applies a personal lockout/tagout to the lock box, securing all the lockout keys within the lock box. The lockout keys cannot be accessed until the last lock is removed from the lock box.

Lockout/Tagout: the placement of lockout and tagout devices on an energy isolating device, according to the established procedures of this program.

Lockout Device: a positive means, such as a lock, for individual control that secures an energy-isolating device in a safe position that prevents the energizing of a machine, equipment or process. This includes devices such as accessories to go over valves and other isolation devices. Pad locks for lockout/tagout must meet the following requirements:

- **Pad locks must be manufactured with a red lock body**, regardless of shank length. Red painted lock bodies are not acceptable.
- Red bodied padlocks shall be considered the standardized lockout device for UConn.
- Red bodied locks must only have one key.
- Red bodied padlocks shall not to be used for any purpose other than lockout/tagout operations.
- Authorized employees must be assigned their own locks.

Qualified Person: One who has skills and knowledge related to the construction and operation of specific machinery, equipment or installations and has received safety training on the hazards involved.

Shop Locks: Locks keyed alike for a particular trade or shop to be used on energy isolating devices whenever they need to be secured, **but only when no one is working on the equipment**. Reasons for installation vary; they may include but are not limited to:

- Equipment is out of service – Waiting for parts.
- Equipment is secured awaiting a following shift's use of lockout/tagout devices.
- Seasonal locking of energy isolating devices (heating or cooling seasons).
- Securing equipment when no work is currently being performed on it.

Tagout Device: A tag, usually plastic or cardstock, together with an attachment means which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment is being controlled and may not be operated until the tagout device is removed. A tagout shall consist of a double-

sided tag compliant with the ANSI/ASSE Z244.1-2016 and ANSI Z535.5 standards. Tag wording shall include “DANGER – Do Not Operate.” Tags shall include a provision for identifying and contacting the person authorizing or applying the tag. Tags shall employ a securing grommet that will accept padlock shanks and be durable enough to withstand their intended use and use environment.

7 RESPONSIBILITIES

7.1 DEPARTMENTS

- Notify and make the Lockout/Tagout Program available to authorized employees, if applicable.
- Ensure departmental-affected employees who use but do not service machinery or equipment are aware of lockout/tagout procedures.
- Identify and ensure all employees who maintain or service machinery and equipment, or who aid in such work, including supervisory staff, complete Lockout/Tagout training through EHS.
- Schedule employees for lockout/tagout retraining through EHS, as required.
- Direct the development and completion of [Machine-Specific Lockout/Tagout Procedures](#) prior to the onset of service or maintenance activities.
- Ensure supervisory staff conduct [Periodic Lockout/Tagout Inspections](#), and correct any deviations or inadequacies, at least annually.
- Provide authorized employees with individually assigned lockout and tagout devices.
- Ensure receipt of the UConn [Contractor EHS Manual](#) by outside contractors and the coordination of lockout/tagout procedures between contractors and UConn staff.

7.2 SUPERVISORS/PRINCIPAL INVESTIGATORS (PI)

- Notify and make the Lockout/Tagout Program available to employees.
- Identify and ensure all employees who maintain or service machinery and equipment, or who aid in such work, including supervisory staff, complete lockout/tagout training through EHS.
- Identify and ensure all affected employees complete Electrical Safety Awareness training.
- Schedule employees for retraining with EHS, as required by this program.
- Develop and ensure employees understand [Machine-Specific Lockout/Tagout Procedures](#), as required, prior to the onset of service or maintenance activities.
- Conduct [Periodic Lockout/Tagout inspections](#) and correct any deviations or inadequacies identified, at least annually.
- Provide authorized employees with individually assigned lockout and tagout devices.

7.3 EMPLOYEES

- Review and comply with the University's Lockout/Tagout Program.
- Attend appropriate training courses through EHS, as required.
- Notify supervisors of any change in their workplace, job duties, or procedures which affects their ability to follow lockout/tagout procedures.
- Follow all lockout/tagout procedures outlined in this program when performing service or maintenance work on machines or equipment.
- Use only approved lockout and tagout devices. Never use lockout or tagout devices for any purpose other than to perform lockout/tagout procedures.
- Remove individually-assigned lockout and tagout devices by the end of their work shift unless it is part of a Boundary Lockout.

7.4 CONTRACTORS

- Contractors must be fully compliant with OSHA regulations [29 CFR 1910.147](#) and [29 CFR 1910.333](#).
- Contractors working on UConn campuses must ensure proper isolation and control of hazardous energy on affected equipment and machinery.
- Contractors must maintain a written program, work cooperatively with UConn personnel in group lockout/tagouts, and comply with the UConn [Contractor EHS Manual](#).
- Contractors must discuss, review, and coordinate lockout/tagout procedures with applicable UConn staff during pre-job meetings.
- The contractor and applicable UConn supervisory staff must discuss and inform employees of the restrictions and prohibitions associated with the lockout/tagout procedures of each group.

7.5 ENVIRONMENTAL HEALTH AND SAFETY

- Develops, implements, and maintains the University's Lockout/Tagout Program.
- Assists supervisors with their annual and periodic lockout/tagout program inspections, upon request.
- Provides Lockout/Tagout training to employees.
- Provides Electrical Safety Awareness training to affected employees.
- Maintains lockout/tagout training records for all UConn employees.
- Maintains copies of periodic lockout/tagout inspections for UConn employees.

8 TRAINING REQUIREMENTS

Employees must be trained according to their assigned duties. EHS will conduct training in conjunction with the appropriate supervisors. The following training is required:

8.1 AUTHORIZED EMPLOYEES

1. Initial training includes how to recognize hazardous energy sources, the type and magnitude of the energy available in the workplace, and the required Lockout/Tagout procedures to be followed to ensure energy isolation and control.
2. Retraining for authorized employees must occur whenever:
 - a. Job assignments change;
 - b. A change in machines, equipment or processes creates a new hazard;
 - c. Lockout/tagout procedures change; or
 - d. Observations or inspections reveal that an employee is not following or does not fully understand the lockout/tagout procedures.

8.2 AFFECTED EMPLOYEES

Affected employees must receive training on the purpose, use, and restrictions of lockout/tagout and how to recognize that lockout/tagout is being implemented. Affected employees must take Electrical Safety Awareness training to cover these requirements.

9 GENERAL LOCKOUT AND TAGOUT PROCEDURES

9.1 SHUTDOWN PROCEDURES- ONE ENERGY SOURCE

1. **Prepare for Shutdown** - Locate and identify all energy isolating devices that apply to the machine or equipment to be locked out. (If more than one energy source is involved, the [Machine-Specific Lockout/Tagout Procedures](#) in Section 10 must be developed and followed instead). Check applicable drawings, diagrams, and identification tags if necessary. Ensure proper PPE is utilized by those involved in the execution of the lockout tagout task.
2. **Notify** all affected employees that a lockout/tagout is about to take place, the reason for the lockout/tagout, and the specific machinery or equipment affected.
3. **Shut down** the machine or equipment by utilizing its normal operating controls.
4. **Isolate** - Operate the disconnect switch, circuit breaker, valve or other energy isolating device to isolate (disconnect) the machine or equipment from its energy source.
5. **Lockout and Tagout** - Apply individually assigned lockout and tagout devices to the energy isolating device.

6. **Relieve/Restrain Stored Energy** - Exhaust or restrain stored or residual energy in the machine or equipment by grounding, blocking, bleeding down, etc.
7. **Verify Isolation** - Clear the area around the machine or equipment of nonessential objects. Make sure that all personnel are safely positioned or removed from the area. Then test all the operating controls by putting them in the “on” position to ensure that the energy source has been successfully disconnected.

CAUTION: Return the operating control(s) to the “Neutral” or “Off” position before proceeding with service and maintenance.

9.2 SHUTDOWN PROCEDURES INVOLVING ELECTRICAL ENERGY SOURCES

For equipment utilizing electrical energy sources, employees must establish and verify an electrically safe work condition by following the steps below in the specific order, if feasible:

1. Determine all the possible sources of electrical supply to the specific equipment. Check applicable drawings, diagrams, and identification tags.
2. After properly interrupting the load current, open the energy isolating device(s) for each source.
3. Wherever possible, visually verify that all blades of the disconnecting devices are fully open, or that draw-out-type circuit breakers are withdrawn to the test or in the fully disconnected position.
4. Release stored electrical energy.
5. Block or relieve stored nonelectrical energy in devices to the extent the circuit parts cannot be unintentionally energized by such devices.
6. Apply lockout/tagout devices.
7. Prior to testing to confirm the absence of voltage, determine that the adequately rated test instrument is operating satisfactorily through verification on any known voltage source. See two exceptions to using an absence of voltage test instrument, below.
8. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground ensuring that before and after each test, the test instrument is operating satisfactorily through verification on the known voltage source.
9. Where the possibility of induced voltages or stored electrical energy exists, ground all circuit conductors and circuit parts before touching them. Where it is reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts, apply temporary protective grounding equipment in accordance with the following:

- a. Placement of Grounding Equipment - Temporary protective grounding equipment shall be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to a shock hazard (i.e., hazardous differences in electrical potential). The location, sizing, and application of temporary protective grounding equipment shall be identified as part of the employer's job planning.
 - b. Capacity of Grounding Equipment - Temporary protective grounding equipment shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault.
 - c. Impedance of Grounding Equipment - Temporary protective grounding equipment and connections shall have an impedance low enough to cause immediate operation of protective devices in case of unintentional energizing of the electric conductors or circuit parts.
10. Once all the steps above have been followed and completed, the **LOCKOUT/TAGOUT IS COMPLETE**, and the authorized employee may proceed with servicing or maintenance work.

Exception #1 to following 9.2, # 7 above: employees may be permitted to use an adequately rated permanently mounted absence-of-voltage-tester to test for the absence of voltage of the conductors or circuit parts at the work location, provided it meets all the following requirements below:

- a. It is permanently mounted and installed in accordance with the manufacturer's instructions and tests the conductors and circuit parts at the point of work;
- b. It is listed and labeled for the purpose of testing for the absence of voltage;
- c. It tests each phase conductor or circuit part both phase-to-phase and phase-to-ground;
- d. The test device is verified as operating satisfactorily on any known voltage source before and after testing for the absence of voltage.

Exception #2 to following 9.2, # 7 above: on electrical systems over 1000 volts, noncontact capacitive test instruments shall be permitted to be used to test each phase conductor.

9.3 RESTART PROCEDURES -- REMOVAL OF LOCKS AND TAGS

1. **Check** the machine/equipment and surrounding area to ensure that nonessential objects have been removed, guards have been reinstalled and that the machine/ equipment is operationally intact.
2. **Verify** operating controls on the machine/equipment are in the "neutral" or "off" position and that all employees are safely positioned or removed from the area.

3. **Remove** lockout and tagout devices.
4. **Notify** affected employees that the servicing or maintenance is complete and that locks and tags have been removed.
5. **Re-energize** the machine or equipment.

10 MACHINE-SPECIFIC LOCKOUT/TAGOUT PROCEDURES - MULTIPLE ENERGY SOURCES

If servicing or maintenance work requires controlling more than one energy source on a machine, written lockout/tagout procedures must be developed for each specific machine. If the methods to control energy sources are identical for a group of machines, then one set of procedures may be developed for the group. EHS is available to assist in developing machine-specific procedures. See Appendix B for more information.

CAUTION: For equipment utilizing electrical energy sources, it is essential to establish and verify an electrically safe work condition by following steps in Section 9.2 Shutdown Procedures Involving Electrical Energy Source, above.

11 SPECIAL SITUATIONS

11.1 GROUP LOCKOUT/TAGOUT

Whenever more than one authorized employee performs lockout/tagout, each individual group member must follow the lockout/tagout procedures outlined in this program. Employees must always use their individually assigned lockout device and never depend upon someone else's lockout device.

Employees must use a "group lockout-tagout box" to secure keys used to apply lockout padlocks to equipment while being serviced. The boxes reduce the number of locks needed for large operations while still providing the same level of safety since each worker only needs to apply one lock in one location rather than at every energy isolating device.

An orderly shutdown of the equipment must be performed by an individual who is knowledgeable of the equipment. Lockout/tagouts are applied on each energy isolating device on an equipment system and the individual then secures the lockout keys in the lockout box with an additional lockout/tagout. Each additional worker then applies a personal lockout/tagout to the box, taking their own key with them. Workers can add and remove their locks as they work on the equipment. The last person to finish work and remove their lock must

notify the person who originally secured the equipment that work is complete, and that it is safe to remove the original lockout/tagouts from the energy isolating devices.

Individual departments are encouraged to develop written procedures for complex operations (especially those conducted regularly) that involve a group lockout/tagout. EHS is available to assist in developing written procedures.

11.2 TAGOUT ONLY PROCEDURES

Tagout without a lock is allowed only when machinery or equipment is incapable of being locked out. Tagout may be implemented only with prior knowledge and approval of the appropriate supervisor, using the following procedures.

1. The authorized employee will advise the supervisor that lockout is not possible.
2. The authorized employee and supervisor must determine if other equally effective controls can be implemented, such as de-energizing an upstream device, the removal of a valve stem, isolating a circuit element, or blocking a controlling switch.
3. Supervisors must provide training to the authorized and affected employees involved in the tagout operation at the time tagout is to be conducted.
4. The authorized employee must follow the applicable lockout/tagout procedures outlined in this program, omitting lockout.
5. The authorized employee must securely attach their tagout device to the energy isolating device where a lockout device would have been attached.

11.3 SHIFT CHANGES

When machines or equipment must be serviced by more than one shift, a procedure must be established for the orderly transfer of responsibility from one shift to another. In developing this procedure, the following must be considered:

1. Each authorized employee must ensure that the equipment they are working on is locked and tagged out with their individually assigned lockout and tagout device. Employees must never depend on someone else's lockout device for protection.
2. Authorized employees must remove their individually assigned lockout and tagout devices once service or maintenance work is completed.
3. Lockout/tagout devices must **never** be left on beyond an authorized employee's work shift. If there is a need to secure equipment beyond a single work shift, the steps below must be followed:

- a. The authorized employee must replace the red lockout locks and “DANGER” tag(s) with shop locks and yellow “CAUTION” advisory tags during the period when no work is being performed.
 - b. The shop locks must secure the equipment until work commences again. The authorized employee who installed the shop locks must include their name, reason for locking, and contact information on the “CAUTION” advisory tags.
 - c. When work commences, the authorized employee must replace the shop locks and “CAUTION” advisory tags with red lockout locks and “DANGER” tags.
4. Boundary Lockout/Tagouts establish “energy isolation boundaries” usually between two UConn work groups, or between UConn and contractor work groups. In this situation, each work group locks and tags each energy isolating device jointly. This is the only situation when red locks and “DANGER” tags remain on equipment beyond a single shift. The lockouts can remain for extended periods of time until work by all groups or contractors is completed. Boundary lockouts normally are installed as group lockout/tagouts and utilize a group lockout-tagout box.

11.4 LOCKOUT AND TAGOUT DEVICE REMOVALS

The key to each lockout device must be in the sole possession of the employee to which it was assigned. Only the authorized employee who applied the lockout or tagout device may remove it, except as noted below.

EXCEPTION: When the authorized employee who applied a lockout or tagout device is not available to remove it, the lockout-tagout device may be physically removed **ONLY** by **TWO** supervisors trained in lockout/tagout, in person, provided that:

1. Absolute verification has been made that the employee is not on University grounds or otherwise available.
2. Every reasonable effort has been made to contact the employee to notify them that their lockout/tagout device has been removed.
3. The employee is informed before returning to work that their lockout/tagout device has been removed.

12 PERIODIC INSPECTIONS

Documented periodic inspections must be made at least annually by supervisors to verify that lockout/tagout procedures are understood by employees and are being followed properly. A Lockout/Tagout Inspection Form is required, provided in [Appendix A](#). A copy of the completed form should be sent to EHS. EHS is available to assist in conducting periodic inspections.

13 CONTRACTOR BIDDING PROCESS

The University's Lockout/Tagout program must be made available for review to all prospective bidders of a contract involving activities subject to OSHA's Lockout/Tagout regulations (29 CFR 1910.147).

Contractors must comply with section 7.4 of this program as well as the UConn [Contractor EHS Manual](#) in the performance of their work on UConn campuses.

Appendices

Appendix A. [Periodic Lockout/Tagout Inspection Form](#)

Appendix B. [Machine-Specific LOTO Procedure Form](#)