

Lockout / Tagout

University Facilities (UF)

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Approved by: Bob Wells, updated Todd Barnette

This document establishes official Procedure for Lockout / Tagout. Full details available at <https://cufacilities.sites.clemson.edu/documents/envSafety/Lockout%20Tagout%20Program.pdf> .

Policy

Employees of Clemson University shall follow Lockout/Tagout procedures:

- During servicing and/or maintenance of machines and equipment.
- During removal or bypassing of a machine guard or other safety device.
- When placing any part of their body into an area where work is actually performed (point of operation) including danger zones with respect to a machine's normal operating cycle.

General Safety Guidelines

It is the responsibility of Department Heads or their designees to complete an equipment specific LOTO procedure using the attached Equipment Energy Control Planning Procedure for every piece of machinery or equipment prior to servicing. This form needs to be completed only one time. The following information must be included:

- Machine or equipment identification.
- Energy sources and isolation devices for each piece of machinery and equipment, and their location.
- The procedure or method required for Lockout/Tagout.
- The shutdown and start-up procedures.

PROGRAM SUMMARY

Under the provisions of CU LO/TO program, certain requirements must be met prior to servicing or repairing certain equipment. In particular, employees and/or their supervisors are required to follow established generic procedures or develop equipment-specific, written energy control procedures (Section V), participate in training (Section VII), and ensure that periodic inspections of energy control procedures and authorized employees are performed and documented (Section VIII). Employees and their supervisors must also be familiar with other elements of the program such as the requirements for work conducted on covered equipment by outside contractors, group LO/TO procedures when service or maintenance activities are performed. Facilities Lockout locks shall be standardized red in color and designated just for lockout/tagout.

Training

Employees shall be trained so that they understand the purpose, contents and requirements of this LOTO program and procedures.

A record of all training and retraining shall be maintained. The training record (sample Employee Training Acknowledge form attached) shall include the name of the employee, name of the instructor and the date of the training. Training records will be retained indefinitely.

Employee retraining will be conducted when there are changes in job assignment; machines, equipment or processes; or in the University's LOTO program and procedures. Retraining will also be conducted when a periodic inspection of the effectiveness of this procedure reveals inadequacies in employee knowledge or performance.

Sample Form

The attached form is only one example of forms associated with Lockout / Tagout procedures. You will be instructed what forms to use as part of the training process.

| LOCKOUT/TAGOUT PROGRAM | | Equipment Energy Control Planning Procedure | |
|--|--|---|-------------|
| EQUIPMENT: | | SER #: | |
| MFG: | | LOCATION: | |
| Purpose: This procedure establishes the minimum requirements for lockout of energy sources that could cause injury to personnel. All employees shall comply with the procedure. | | | |
| Responsibility: The responsibility for seeing that this procedure is followed is incumbent upon all employees. All employees shall be instructed in the safety significance of the lockout procedure by their supervisor or manager. Each new or transferred affected employee shall be instructed by their supervisor or manager in the purpose and use of the lockout procedure. | | | |
| Preparation for Lockout: Employees authorized to perform lockout shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, or others) may be involved. Any questionable identification of sources shall be cleared by the employees with their supervisors or managers. | | | |
| ENERGY SOURCE | | ISOLATION DEVICE(S) | LOCATION(S) |
| Electric | | | |
| Pneumatic | | | |
| Hydraulic | | | |
| Gravity | | | |
| Mechanical | | | |
| Thermal | | | |
| Chemical | | | |
| Other | | | |
| POTENTIAL HAZARDS: | | | |
| <i>Remember to Release All Stored Energy and notify Supervisor after lockout but before starting work.</i> | | | |
| SHUTDOWN PROCEDURE: | | START-UP PROCEDURE: | |
| | | | |
| Restoring Equipment to Service: When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed. When the equipment is clear, remove all locks. The energy isolating device may be operated to restore energy to the equipment. | | | |
| Rules for Using Lockout Procedure: All equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock. | | | |

Review the following exceptions to determine if you must use or write a specific procedure for this LOTO action.

MARK EACH BOX IF IT APPLIES:

- The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees
- The machine or equipment has a single energy source which can be readily identified and isolated
- The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment
- The machine or equipment is isolated from that energy source and locked out during servicing or maintenance
- A single lockout device will achieve a locked-out condition
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance
- The servicing or maintenance does not create hazards for other employees
- The employer, in utilizing this exception has had no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance

IF ALL BOXES ARE CHECKED – YOU DO NOT HAVE TO WRITE A SPECIFIC PROCEDURE FOR THIS LOTO ACTION.

If at least one box is unchecked and there are no procedures already written for this LOTO requirement, complete the other side, make a copy for your supervisor, and post this procedure on or near the equipment in a plastic sleeve.

| | | | |
|--|--|-------|--|
| Signature of employee who provided this information: | | | |
| Print Name: | | Date | |
| Signature of employee who provided this information: | | | |
| Print Name: | | Date: | |
| Signature of employee who provided this information: | | | |
| Print Name: | | Date: | |

Detailed LOTO Procedure

- Affected Employees must be notified by the Authorized Employee of the application and removal of LOTO devices. Notification must be given before the controls are applied, and after they are removed from the machine or equipment.
- Preparation for shutdown
 - Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have been trained.
 - The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown will avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
- Energy Isolation
 - Evaluation
 - Review the surrounding area for other possible sources of energy transmission.
 - Inspect the immediate area where locks or tags will be attached.
 - Notify all employees in the general vicinity that LOTO procedures are being implemented.
- Electrical Control
 - Unplug the machine or piece of equipment using an electrical plug lock or a disconnect switch with padlocks, locks and tags.
 - Ensure that all power sources are locked and tagged out.
 - Bleed any stored electrical energy to a "zero energy state."
 - Use a tester to check that all circuits are dead.
- Pneumatic control
 - Release the pressure to reach a "zero energy state."
 - Lockout the energy source using lockout valves.
- Hydraulic Control
 - Release pressure valve to reach a "zero energy state."
 - Lockout the energy source using lockout valves, chains, padlocks, or locks
- Fluids and Gasses
 - Evaluate all hoses and valves.
 - Insert a blank or blind in the line.
 - Use lockout valves, chains, padlocks, or locks at the isolating source.
- Lockout or Tagout device application
 - Install all energy isolating devices that are needed to control the energy to the machine or equipment to isolate the machine or equipment from the energy source(s).

- Tagout devices, where used, shall be attached in such a manner that will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.
 - Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.
- Verification of isolation
 - Prior to starting work on machines or equipment that have been locked out or tagged out; the Authorized Employee shall try to startup the machine or equipment to verify that the machine or equipment has been de-energized. (Example: pushing local start buttons, throwing switches, etc.). Ensure the operating controls are returned to the OFF or NEUTRAL positions. The work can now begin.