

SUNY Cortland – Environmental Health and Safety Office

Lockout/Tagout Program

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Lockout/Tagout Program

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I. Introduction

This program establishes the minimum requirements for the lockout and tagout of energy isolating devices whenever maintenance or servicing is to be conducted on machines or equipment. It applies to maintenance and servicing operations where the unexpected energization, start up of machines or equipment, or release of stored energy could cause injury. This program does not apply to the following:

1. Normal operations where one is not required to remove or bypass guards or safety devices, or to place any part of one's body into a danger area during an equipment operating cycle.
2. Work on cord or plug connected electrical equipment for which exposure to the hazards of unexpected energization or start-up is effectively controlled by unplugging the equipment from the energy source and keeping the plug under exclusive control of the employee performing the maintenance. Exclusive control is in the physical possession of the employee or within arm's reach and in sight. If the plug and cord is not under the exclusive control of the employee, then a lockout device will be affixed to the plug and a tag applied.

All SUNY Cortland employees and contractors are expected to observe the requirements and guidelines outlined in this program.

II. References

1. Control of Hazardous Energy Sources – Lockout/Tagout (29 CFR 1910.147).
2. Electrical Safety Work Practices (29 CFR 1910.331-335).
3. National Institute for Occupational Safety and Health’s “Guidelines for Controlling Hazardous Energy During Maintenance and Servicing”.

III. Definitions

Affected Employee – An employee whose job requires work in an area where lockout/tagout devices are used.

Authorized Employee – An employee who has been given the authority, responsibility and training to implement a lockout/tagout procedure prior to starting maintenance on equipment. An authorized employee has also demonstrated proficiency in executing safe lockout/tagout practices.

Energy Isolating Device – A mechanical device that physically prevents the transmission or release of energy. Examples include: 1) manually operated electrical circuit breaker; 2) disconnect switch; 3) manually operated switch; 4) slide gate; 5) line valve; or 6) block. Note: Electrical energy isolating devices must simultaneously disconnect all ungrounded supply conductors, push buttons, selector switches and other control circuit devices.

Energy Source – Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy. Examples include: 1) steam; 2) energized electrical parts; 3) hydraulic or pneumatic pressure; 4) compressed or extended springs; 5) pressure below atmospheric (e.g., vacuum systems); 6) flywheels; 7) batteries; 8) capacitors; 9) thermal energy; 10) residual chemicals causing thermal or pressure build-ups; 11) gravity; or 12) static electricity.

Equipment – A term used in this document to denote tools, appliances, machines and equipment that utilize or produce energy.

Lockout – The placement of a lock on an energy isolating device in accordance with an established procedure to insure that the energy isolating device cannot be operated until the lock is removed.

Lockout Device – A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Lockout devices must be: 1) durable; 2) standardized; 3) substantial; and 4) identifiable.

Maintenance – A term used in this document to denote workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, maintaining and

servicing equipment. These activities include cleaning, lubricating, un-jamming equipment, and making adjustments or tool changes where employees may be exposed to unexpected energization or start-up of equipment or release of stored energy.

Multiple Energy Sources – A combination of two or more available energy sources on a machine or piece of equipment. Examples include: 1) steam; 2) energized electrical parts; 3) hydraulic or pneumatic pressure; 4) compressed or extended springs; 5) pressure below atmospheric (e.g., vacuum systems); 6) flywheels; 7) batteries; 8) capacitors; 9) thermal energy; 10) residual chemicals causing thermal or pressure build-ups; 11) gravity; or 12) static electricity.

Tagout – The placement of a warning tag on an energy isolating device in accordance with an established procedure to indicate that the energy isolating device must not be operated until the tag is removed.

IV. General Requirements

Energy Control – Hazardous energy sources must be isolated and rendered inoperative before an employee performs maintenance on equipment where the unexpected energization, start-up or release of stored energy could cause injury.

Lockout/Tagout – Whenever possible, energy isolating devices must be locked out. Energy isolating devices that are incapable of being locked out must be tagged out. Whenever equipment is installed, relocated, or undergoes major modification, renovation, or repair, energy isolating devices capable of being locked out should be installed.

Full Employee Protection – A tagout device alone should never be used on an energy isolating device that is capable of being locked out. When a tagout device alone is used because an energy isolating device is incapable of being locked out, additional safety measures should be taken to reduce the likelihood of inadvertent energization, such as, removing an isolating circuit element, blocking of a controlling switch, removing a valve handle, or opening an extra disconnecting device.

Energy Control or Lockout/Tagout Procedure – Aside from the exception outlined below, a procedure should be developed, documented and utilized for the lockout/tagout of potentially hazardous energies prior to maintenance of each type of equipment. The procedure should clearly and distinctly outline the scope, purpose, authorization, rules, techniques to be applied, and the measures to enforce compliance. The procedure should include the following: 1) a specific statement of the intended use of the procedure; 2) specific steps for shutting down, isolating, blocking and securing equipment to control hazardous energy sources; 3) specific steps for the placement, removal and transfer of lockout/tagout devices and the responsibility for

them; and 4) specific requirements for testing equipment to determine and verify the effectiveness of lockout/tagout devices, and other energy control measures.

Exception: In certain limited situations, because of the simplicity of a particular piece of equipment and the lockout measures to be used, a documented procedure may not be required when all of the following conditions exist: 1) the equipment has no potential for stored or residual energy; 2) the equipment has a single, readily identified and isolated energy source; 3) the isolation and lockout of that energy source will completely de-energize and de-activate the equipment; 4) the equipment is isolated from that energy source and locked out during maintenance; 5) single lockout device will achieve a locked out condition; 6) the lockout device is under the exclusive control of the authorized employee performing the maintenance; 7) maintenance does not create hazards for other employees; and 8) there have been no previous incidents involving the unexpected activation or re-energization of the equipment during maintenance.

V. Locks, Tags, and Other Appurtenances

Requirements for locks, tags, and other appurtenances are summarized as follows:

1. Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware should be provided for isolating, securing or blocking equipment energy sources.
2. Locks and tagout devices should: 1) be singularly identified; 2) be the only devices used for controlling energy; and 3) not be used for other purposes.
3. Locks and tagout devices should be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected. Tagout devices should withstand exposure to weather conditions and wet or damp locations without deteriorating or becoming illegible.
4. Locks and tagout devices should be standardized in color, shape and size. Tagout device print and format should also be standardized. A photograph of the lock and tag used for SUNY Cortland's Lockout/Tagout Program is provided on page 9.
5. Lockout devices should be substantial enough to prevent removal without the use of excessive force or unusual techniques. Tagout devices, including their means of attachment, should be substantial enough to prevent inadvertent or accidental removal. The attachment means should be self-locking with no reusable nylon cable tie.
6. Reusable tagout devices should indicate the identity of the employee applying the device. The month, day and year the device was applied and the purpose for which it was applied should be indicated. Additionally, tagout devices should warn against hazardous conditions if the equipment is energized and should include a hazard warning. SUNY Cortland tags indicate "Danger Do Not Operate" as pictured on page 9.

VI. Periodic Inspections

1. In instances where formal energy control or lockout/tagout procedures have been developed, periodic inspections must be completed at least annually by supervisors or a designated representative (e.g., Environmental Health and Safety Office employee) with an authorized employee other than the one(s) utilizing the energy control procedure being inspected. This will ensure that the requirements of this standard are being observed. Inspection results should be used to correct any deviations or inadequacies. The inspection should include a review of responsibilities with each authorized employee. If tagout only is used for energy control, the inspection should include a review of responsibilities with each affected employee.
2. Periodic inspections should be certified by using the Periodic Inspection Form (see Periodic Inspection Form in Appendix A on pages 10 and 11). The certification should identify the equipment on which the lockout/tagout procedure was being used, the inspection date, the employees included in the inspection and the name of the person conducting the inspection.
3. All lockout/tagout procedures that are new or have been changed since the previous periodic inspection must be documented and reviewed with all authorized employees who could use these procedures. The certification must include the equipment on which the procedure was changed, or the equipment on which the new procedure was written. It must include a list of all authorized employees reviewing the new or changed procedures and the date the review was completed.

VII. Training

Training should be provided to ensure that the purpose and function of the energy control program is understood and that employees have the knowledge and skills required for the safe application, usage, and removal of energy controls. Minimum training requirements are summarized as follows:

1. Authorized employees should receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available, and the methods and means necessary for energy isolation and control.
2. Affected employees should be instructed in the purpose and use of lockout/tagout procedures.
3. All other employees whose work operations are or may be in an area where energy control procedures may be utilized should be instructed in the significance of lockout/tagout procedures.

When tagout systems are used, employees should also be trained to recognize the following:

1. Tags are essential warning devices and do not provide the physical restraint that is provided by a lock.
2. Tags should only be removed by the authorized employee who attached it, and should never be bypassed, ignored or otherwise defeated.
3. Tags should be legible and understandable by all employees who are or may be in the area.
4. Tags and their means of attachment should be made of materials which will withstand the environmental conditions encountered in the workplace.
5. Tags may evoke a false sense of security.
6. Tags should be securely attached to energy isolating devices so they cannot be inadvertently or accidentally detached.

Retraining should be provided for all authorized and affected employees whenever there is: 1) a change in their job assignment; 2) a change in the equipment or process that presents a new hazard; 3) a change in the lockout/tagout procedure; or 4) when evidence from a periodic inspection reveals that there are deviations from or inadequacies in the employee's use of the procedure. This training should reestablish employee proficiency and introduce new or revised control methods and procedures as necessary.

Finally, training records should certify that employee training has been accomplished and is being kept up to date. The certification should contain each employee's name and the date of training.

VIII. Safe Work Practices

Energy Isolation – Implementation of the lockout/tagout procedure should be performed only by an authorized employee.

Notification of Employees – Authorized employees should notify all affected employees when lockout/tagout devices are applied or removed. Additionally, affected employees must observe work restrictions that are imposed when equipment or machines are locked and tagged out and not tamper with lockout/tagout devices. These requirements also apply to lockout/tagout practices implemented by contractors.

Application of Control – Each lockout/tagout procedure should cover the following elements and actions and should be implemented in the following sequence:

1. **Preparation for Shutdown** – Before equipment is shut down, the authorized employee should know the magnitude, source and hazards, and the method or means to control each type of hazardous energy.

2. **Machine or Equipment Shutdown** – Operating equipment should be shut down using the normal stopping procedure to avoid any additional or increased hazard.
3. **Machine or Equipment Isolation** – Energy isolating devices should be located and operated such that the equipment is isolated from every energy source.
4. **Lockout/Tagout Device Application** – A lockout/tagout device should be affixed to each energy isolating device by the authorized employee, and the lockout device should be affixed in a manner that will hold the energy isolating device in a “safe” or “off” position. A tagout device should be affixed in a manner that will clearly indicate that the operation or movement of the energy isolating device from the “safe” or “off” position is prohibited. When the tag cannot be affixed directly to the energy isolating device, the tag should be located as close as safely possible to the device, and in a position that will be immediately obvious to anyone attempting to operate the device.

Stored Energy – All potentially hazardous stored or residual energy should be relieved, disconnected, restrained, or otherwise rendered safe. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation should be continued until the maintenance is completed, or until the possibility of such accumulation no longer exists.

Verification of Isolation – Prior to starting work on equipment that has been locked out or tagged out, the authorized employee should verify that isolation and de-energization of the equipment has been accomplished.

Release from Lockout/Tagout – Before the lockout/tagout device is removed and energy is restored to the equipment, the lockout/tagout procedure should be followed and actions should be taken to ensure: 1) the work area is inspected by the authorized employee and ensure that nonessential items have been removed; 2) equipment components are operationally intact; and 3) affected employees are notified by the authorized employee that the lockout/tagout device is being removed and the work area will be checked to ensure that all employees have been safely positioned or removed.

IX. Lockout/Tagout Device Removal

Each lockout/tagout device should be removed from each energy isolating device by the employee who applied it. If the employee who applied the lockout/tagout device is not available to remove the device, it may be removed only by the employee’s supervisor who will: 1) verify that the employee who applied the lockout/tagout device is not on the site; 2) verify that it is safe to remove the device and restore the energy to the equipment; 3) make all reasonable efforts to contact the employee to serve notification that the lockout/tagout device was removed; and 4) ensure that the employee knows that the lockout/tagout device was removed before resuming work at the site.

X. Additional Requirements

Testing or Positioning of Equipment or Components – When a lockout/tagout device must be temporarily removed from the energy isolating device and the equipment energized to test, position, or debug the equipment or a component thereof, the following sequence should be followed: 1) clear the equipment of tools and materials; 2) remove affected employees from the equipment area; 3) remove the lockout/tagout device; 4) energize the equipment and proceed with testing, positioning, or debugging; and 5) de-energize all systems and reapply energy control measures before continuing maintenance.

Group Lockout/Tagout – When maintenance is performed by more than one employee, the lockout/tagout procedure used should afford a level of protection equivalent to that provided by the implementation of a personal lockout/tagout device. The lockout/tagout procedure used should comply with the following requirements:

1. Primary responsibility for implementation of the procedure should be assigned to one lead employee who should attach a group lockout device to each energy isolating device.
2. The lead employee should ascertain the exposure status of each of the other employees.
3. When more than one department (e.g., contractor personnel and SUNY Cortland employees) are involved in the maintenance activity, one lead employee should be designated to coordinate the overall activity and ensure continuity of protection.
4. Each employee should affix a personal lockout device to each group lockout device when work begins and should remove each device when work terminates on the equipment.

Shift or Personnel Changes – If the job is to be continued to the following shift, the employees going off the job should not remove their locks until those on the next shift have been properly briefed and have attached their locks. If there is a time lapse between shifts, as in the absence of second or third shift or during weekends or holidays, lockout and tagout devices must not be removed. If, in these instances, it becomes necessary to remove lockout and tagout devices, supervisors who have master keys must first determine why a piece of equipment is locked and tagged out and ensure the equipment is safe before removing a lock and tag.

Other Hazards – Materials having toxic, caustic, or asphyxiating properties can present serious hazards and are beyond the scope of this standard. Additional guidelines may have to be met to ensure a safe working environment. Employees should contact the Environmental Health and Safety Office prior to executing work in hazardous environments.

XI. Contractors

While SUNY Cortland does not specify specific safe work practices for contractors, contractors are expected to observe all relevant safe work practices and requirements outlined in this program and in OSHA's Lockout/Tagout Standard (29 CFR 1910.147). This program will be made available to contractors for reference whenever it is necessary.

Photograph #1 - SUNY Cortland's Lock and Tag



Appendix A – Periodic Inspection Form

1. Choose a lockout/tagout (LOTO) procedure for multiple sources of energy that has been performed within the last year. If no LOTO procedure for multiple sources of energy were performed within the last year, proceed to step 10.
2. For the chosen LOTO procedure, indicate the information below:
Equipment name:
Authorized employee name(s):
Department:
Location:
Date:
3. Have an authorized employee (other than the one(s) listed above) walk through the physical LOTO step-by-step with a supervisor or a designated representative, and record the following information:
Person conducting the inspection:
Authorized employee name:
Department:
Date:
4. Has all energy that constitutes a personal hazard been isolated, blocked, or dissipated at the points of control?
Yes___ No___ N/A___
5. Have stored hazardous energy levels, in any form, been reduced to a non-hazardous level?
Yes___ No___ N/A___
6. Have special measures been used to monitor or continuously bleed-off built-up energy?
Yes___ No___ N/A___
7. Are locks and tags in place on each lockable disconnecting means that are used to de-energize the circuits and the equipment, and has each authorized employee working on the tool used their own lock and tag?
Yes___ No___ N/A___
8. Before equipment is energized, have appropriate tests and visual inspections been conducted to verify that all affected employees, tools, mechanical restraints, and test equipment have been accounted for?
Yes___ No___ N/A___
9. List discrepancies found and action to be taken for all questions answered “No” in steps 4 through 8.
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.

Appendix A – SUNY Cortland’s Periodic Inspection Form (continued)

10. Have there been any new multiple source LOTO procedures implemented in the past 12 months? If yes, go to steps 11 and 12. If no, go to step 13.

Yes ___ No ___ N/A ___

11. Have these procedures been reviewed with all authorized employees who could use the procedures?

Yes ___ No ___ N/A ___

12. List equipment or machines with new LOTO procedures and specify locations.

Equipment _____	Location _____
Equipment _____	Location _____
Equipment _____	Location _____

13. Have there been any multiple source LOTO procedures where changes have been made in the last 12 months? If yes, go to steps 14 and 15. If no, go to step 16.

Yes ___ No ___ N/A ___

14. Have changed procedures been reviewed with all authorized employees that can use the procedures? If yes, go to step 15.

Yes ___ No ___ N/A ___

15. List equipment or machines with changed LOTO procedures and specify locations.

Equipment _____	Location _____
Equipment _____	Location _____
Equipment _____	Location _____

16. List all authorized employees and the date they reviewed and confirmed any new or changed procedures.

Authorized Employee Name: _____	Date: _____
Authorized Employee Name: _____	Date: _____
Authorized Employee Name: _____	Date: _____