

LOCKOUT/TAGOUT PROGRAM LOTO

THE CONTROL OF HAZARDOUS ENERGY

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REVISIONS

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SMCC employees are encouraged to comment on the Plan and make suggestions for changes to:

SMCC Environmental Health and Safety
741-5932

1.0 INTRODUCTION

Southern Maine Community College developed this Lockout/Tagout Program to protect employees from injuries while servicing and maintaining equipment. The program establishes requirements for hazardous energy control to ensure that machines and equipment are isolated from all potentially hazardous energy sources whenever servicing or maintaining activities are in progress.

This Lockout/Tagout (LOTO) Program follows OSHA's Hazard requirements outlined in the Code of Federal Regulations at 29 CFR 1910.147.

The Program applies to faculty, staff, and work study students who may have cause to work on or repair machinery connected to energy sources. These can include:

- Electrical devices,
- Electrical panels,
- Compressors,
- Pressurized lines and hoses,
- Pneumatic equipment,
- Thermal devices (hot and cold),
- Welding equipment, and
- Hydraulic lifts.

For definitions which apply to this program, see Appendix A.

2.0 PROGRAM ADMINISTRATION

The table below provides the roles and contact information for the administration of the LOTO Program.

TABLE 1
Contact Information

Responsibility	Contact Person
LOTO Program Administrator	EH&S Coordinator
Alternate LOTO Program Administrator	Facilities & Project. Manager
Trainer	Supervisor
Authorized Employee	See Appendix B

2.1 PROGRAM ADMINISTRATOR

The program administrator provides guidance to faculty and staff on how to implement LOTO procedures; provides training on the LOTO program and conducts an annual inspection to ensure that the hazardous energy-control procedures are being followed.

2.2 TRAINER

The trainer will conduct or arrange for training of authorized and affected employees, and provide retraining whenever there is:

- A change in an employee's job assignments;
- A change in machines, equipment, or processes that present a new hazard;
- A change in the lockout or tagout procedures; or
- An employee who demonstrates a lack of knowledge or skill in LOTO procedures.

2.3 AUTHORIZED EMPLOYEES

Authorized employees are those approved to apply LOTO devices and procedures and who have been trained to recognize and control hazardous energy sources. The list of authorized employees is found in Appendix B.

Individual departments may request to have a qualified member designated as an Authorized Employee. This will be done on an individual basis. However, the final decision as to whether LOTO is required will be made by Facilities Management.

For equipment and machinery requiring repair or service not listed as exempt in Section 5.3, a work order must be submitted to Facilities through the Work Order System. The lockout or tagout will be assigned to an Authorized Employee. *No repairs shall be initiated until an Authorized Employee has completed LOTO, even if the individual department will do the work.*

3.0 EMPLOYEE TRAINING

3.1 INITIAL TRAINING

3.1.1 Authorized Employee

Each authorized employee must be trained in the recognition of applicable hazardous energy sources, the types and magnitude of energy sources available in the workplace, and the methods and means necessary for energy isolation and control. Record of training for all Authorized Employees must be maintained on file with the employee supervisor and submitted to the Program Administrator.

3.1.2 Affected Employee

Each affected employee will be instructed in the purpose and use of the LOTO procedure and the prohibition relating to attempts to restart or reenergize machines or equipment that are locked out or tagged out. Record of training for all Affected Employees must be maintained on file with the employee supervisor and submitted to the Program Administrator.

3.1.3 Other Employees

Other employees whose work operations are or may be in an area where energy-control procedures may be utilized will be instructed in this procedure and their responsibility not to restart or reenergize machines or equipment that are locked out.

3.2 TAGOUT LIMITATIONS

Employees will be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy-isolating devices and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy-isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area in order to be effective.
- Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy-control program.
- Tags must be securely attached to energy-isolating devices so that they cannot be inadvertently or accidentally detached during use.

3.3 REFRESHER TRAINING

Retraining for all authorized and affected employees will be provided to ensure employee proficiency and introduce new or revised control methods and procedures whenever:

- There is a change in their job assignments;
- There is a change in machines, equipment or processes that present a new hazard;
- There is a change in the energy control procedures; or
- There are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

4.0 USE OF HAZARDOUS ENERGY-CONTROL DEVICES

LOTO devices will be the only devices used for controlling hazardous energy and will not be used for any other purposes. Any devices used for LOTO will be capable of withstanding the environment to which they are exposed for the maximum period they are expected to be exposed.

4.1 AN INVENTORY AND LOCATION OF SMCC LOTO DEVICES IS INCLUDED IN APPENDIX C. EMPLOYEE COMPLIANCE

LOTO procedures may be performed by authorized employees only. All staff are required to comply with the restrictions and limitations imposed on them during the use of lockout. All affected employees, upon observing a machine or piece of equipment that is locked out to perform servicing or maintenance, will not attempt to start, energize, or use that machine or equipment.

Employees trained in the lockout process (authorized or affected employees) must follow lockout procedures as trained. Failure to follow the lockout procedures and/or violation or tampering of lockout equipment can result in disciplinary action. All violations of LOTO procedures or tampering with LOTO equipment will be documented on the Lockout Violation Log located in Appendix D. Any documented employee violations of LOTO will be reported to the employees supervisor or academic chair and the responsible Dean for additional action.

4.2 LOCKOUT DEVICES

Lockout is the primary and preferred method for controlling hazardous energy. During servicing or maintenance, a machine utilizing any mechanical power source such as electrical, pneumatic, steam, hydraulic, and/or air will be locked out when the unexpected start-up of the machine or equipment or release of stored energy could cause injury to staff. The lockout will render the machine inoperative and immovable. Lockout devices will be substantial enough to prevent removal without excessive force (e.g. use of bolt cutters or other metal-cutting tools). Lockout devices will indicate the identity of the authorized employee who applied the device.

4.3 TAGOUT DEVICES

When the energy-isolating devices are not lockable, tagout will be used. Energy-isolating devices will be tagged out of service with a warning tag attached at the power source. In the case of a plug-in power source, the tag will be attached at the plug. Tagout devices will be substantial enough to prevent inadvertent or accidental removal. They will be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible. They will be non-re-usable and attached by hand.

The tagout devices will indicate the identity of the authorized employee applying the device(s).

Tagout devices will warn against hazardous conditions if the machine or equipment is energized and will include a legend such as the following: “Do Not Start,” “Do Not Open,” “Do Not Close,” “Do Not Energize,” or “Do Not Operate.”

Any machinery or equipment that is locked out will also be tagged out. The tagout device will be attached at the same location that the lockout device is attached.

4.4 USE OF TAGS WHEN THE ENERGY-ISOLATING DEVICE IS LOCKABLE

Tags will never be used as a substitute for lockout of machinery or equipment that is capable of being locked out.

5.0 HAZARDOUS ENERGY CONTROL PROCEDURES

5.1 GENERAL

SMCC has a wide variety of machinery and powered equipment for which LOTO is mandatory. Each program must complete their own LOTO Assessment to determine where LOTO is required. A list of typical tasks, machinery and equipment requiring LOTO is included below.

TYPICAL TASKS, MACHINERY, AND EQUIPMENT THAT REQUIRE LOCKOUT/TAGOUT

- All electrically powered machinery or devices not otherwise specified below
- Compressors
- Computer servers
- Electrical panels
- Hydraulically operated machines and test equipment
- Machine tools
- Medical diagnostic equipment
- Parts washers
- Powered industrial trucks and vehicles such as forklifts and skid-steer loaders
- Pneumatic equipment
- Pressurized lines and hoses
- Pumps
- Solar panels
- Spray booths
- Thermal devices (hot and cold) including oil burners, ovens, heaters, air conditioners, and laboratory test equipment
- Vacuum systems
- Welding equipment
- Woodworking and metal-working machinery

5.2 DETERMINING WHAT LOTO PROCEDURES APPLY

Each Department must complete a lockout assessment for equipment in their area to determine if the equipment is excluded from LOTO program, falls under plug connected electrical equipment, simple electrical equipment/machinery or if written equipment specific LOTO procedures apply. A list of equipment with record of lockout assessment must be maintained in a department LOTO file. Any equipment requiring specific LOTO procedures must have written procedures developed as specified in section 5.6.

5.3 EXEMPTIONS

The following tasks do not require lockout or tagout procedures:

- Work on vehicles;
- Work on photocopiers, printers, computers, and other office equipment;
- Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided it is demonstrated that:
 - Continuity of service is essential;
 - Shutdown of the system is impractical; *and*
 - Manufacturer’s procedures are followed, and special equipment (if required) is used that will provide proven, effective protection for staff.

5.4 PLUG CONNECTED ELECTRICAL EQUIPMENT

The LOTO Program does not apply to work on cord and plug connected electrical equipment, for which exposure to hazards of unexpected energization or activation is controlled by unplugging the equipment or machine from its electrical energy source. Employees performing servicing or maintenance on cord and plug equipment or machinery must meet or follow these guidelines:

1. All hazards associated with the unexpected energization or activation of the equipment or machinery need to be eliminated by solely unplugging the equipment or machinery (the only power source);
2. The person performing the servicing or maintenance must unplug the equipment prior to beginning their work; and
3. The plug end must remain under the exclusive control of the employee performing the servicing or maintenance. This can be accomplished by having the servicing or maintenance employee keep the plug end in sight, and within close proximity.
4. If the equipment or machinery cannot be repaired and placed back into service without the employee maintaining exclusive control of the plug end, LOTO must be performed by an authorized employee.

5.5 SIMPLE ELECTRICAL EQUIPMENT OR MACHINERY LOCKOUT/TAGOUT PROCEDURES

LOTO may be performed following the general procedures outlined in 5.5.1 below, for electrical equipment or machinery meeting the following criteria (1-8).

1. The machine or equipment has no potential for stored or residual energy or buildup of stored energy after shutdown which could endanger staff.
2. The machine or equipment has a single energy source, such as a circuit breaker or plug-in cord that can be readily identified and isolated.
3. The isolation and locking out of that energy source must completely de-energize and deactivate the machine or equipment.
4. The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
5. A single lockout device can achieve a locked-out condition.
6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
7. The servicing or maintenance does not create hazards for other staff.
8. There have been no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.

This equipment does not require equipment specific procedures, but this equipment must be identified for each program.

5.5.1 General procedures to lock out or tag out machinery or equipment:

- Step 1. Submit a work order to Facilities for the LOTO of the equipment and document the assigned Authorized Employee.
- Step 2. Notify all affected staff that the machine or equipment will be shut down and locked out to perform the servicing or maintenance.
- Step 3. The authorized employee will identify the type and magnitude of the energy that the machine or equipment utilizes, will understand the hazards of the energy, and will know the methods to control the energy using machine and equipment specifications if available.
- Step 4. If the machine or equipment is operating, it will be shut down by the normal stopping procedure.
- Step 5. The energy source will be deactivated so that the machine or equipment is isolated from the energy source.
- Step 6. The piece of equipment or machine will be locked and/or tagged out with assigned individual locks or tags.
- Step 7. Stored or residual energy (e.g., energy in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, compressors, and air, gas, steam, or water pressure) will be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, or other appropriate means.
- Step 8. Authorized employees will verify that the equipment is disconnected from the energy source by:
 - Checking that no students, staff, or faculty are exposed, then
 - Verifying the isolation of the equipment by operating the push button or other normal operating controls or by testing to make certain the equipment will not operate. *Caution: Operating controls must be returned to neutral or the “off” position after verifying the isolation of the equipment.*
- Step 9. The machine or equipment is now locked or tagged out.

5.5.2 Restoration of Service

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the authorized employee will take the following steps:

- Step 10. Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components and guards are operationally intact.
- Step 11. Check the work area to ensure that all staff have been safely positioned or removed from the area.

- Step 12. Verify that the controls are in neutral.
- Step 13. Remove the lockout or tagout device and reenergize the machine or equipment. *Note:* The removal of some forms of blocking may require the machine to be reenergized before safe removal.
- Step 14. Notify affected employees that the lockout or tagout devices have been removed and the machine or equipment is ready for use.
- Step 15. Close the work order.

5.5.3 Testing of Systems or Equipment

Whenever lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the system, equipment or component thereof, the following sequence of actions will be followed:

- Step 1. Clear the machine or equipment of tools and materials.
- Step 2. Remove employees from the machine or equipment area.
- Step 3. Remove the lockout or tagout devices.
- Step 4. Energize and proceed with testing or positioning.
- Step 5. De-energize all systems and reapply energy control measures to continue the servicing and/or maintenance.

5.6 EQUIPMENT SPECIFIC LOTO PROCEDURES

For equipment or machinery not meeting the eight conditions for general LOTO procedures, a LOTO procedure specific to the equipment must be prepared. (Examples include air compressors and hydraulic lifts, both requiring a specific written procedure.) LOTO procedures must include the following elements:

- Step 1. The specific types of energy to be controlled;
- Step 2. Specific procedural steps for shutting down, isolating, blocking, and securing the machine or equipment to control hazardous energy;
- Step 3. Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them; and
- Step 4. Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

It is up to each department to determine which machinery and equipment requires a specific Lockout/Tagout procedure and then generate the written procedures using the forms found in Appendix E.

The equipment specific procedures will be maintained by the Program Administrators and in each department LOTO file.

5.7 GROUP LOTO

When the servicing and/or maintenance of an energized system or equipment each authorized employee will place their own lock or tag on to the group lockout device when they begin work and will remove those devices when they stop working on the machine or equipment being serviced or maintained at each energy-isolating source. The authorized employee has the same responsibility as if they were performing the Lockout by themselves. Lock placement and removal shall be coordinated between the differing job classes. *No employee may affix or remove a personal Lockout/Tagout device for another authorized employee.*

5.8 EMERGENCY REMOVAL OF AN ENERGY CONTROL DEVICE

Only the Program Administrator or Alternate Program Administrator may authorize the removal of a lockout or tagout device in the absence of the authorized employee that applied the device.

In the event that a lockout or tagout device must be removed and the authorized employee that applied it is not in the facility, the following procedure will be followed:

- Step 1. Verify that the authorized employee who applied the device is not in the facility.
- Step 2. Make reasonable efforts to advise the authorized employee that the device has been removed.
- Step 3. Ensure that the authorized employee is informed of the removal of the device before the person resumes work at the facility.

Each time that a lock out or tag out device must be removed the Lock Removal Form in Appendix F must be completed and retained in the Program Administrators file.

5.9 SHIFT OR PERSONNEL CHANGES

The following steps will be followed to ensure continuity of employee protection during shift or personnel changes:

- Step 1. If they are the only individual/shift to work on the equipment or machine, leave their attached locks until they complete their maintenance or servicing.

If another shift will be continuing the maintenance or service work, the authorized individuals from the on-coming and off-going shifts will transfer responsibilities from the off-going shift to the on-coming shift. The off-going shift will remove their lock and the on-coming shift will install their own lock in accordance with the Lockout procedures.

5.10 PROCEDURES FOR CONTRACTORS

All contractors, including temporary employees, must be advised in the contract documents that SMCC has and enforces the use of LOTO procedures. Contractors must be informed of the use of locks and tags and notified about the prohibition relating to attempts to restart or reenergize machines or equipment that are locked out or tagged out. The Contractor Notification Form in Appendix G must be completed and kept on file with the Program Administrator. SMCC staff the responsible for the contracted work will obtain information from the contractor about the restrictions and prohibitions associated with the contractor's energy-control procedures and advise affected employees of this information.

6.0 PROGRAM INSPECTION

An inspection of LOTO procedures will be conducted annually by department heads to ensure the procedures and the requirements of this program are being followed. The Program Administrator may conduct a follow-up inspection for compliance. Department heads will inform the Program Administrator of their inspection and of any discrepancies or changes required for compliance.

The department head will ensure that any deviations or inadequacies identified during the inspection are corrected.

The inspection will include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy-control procedure being inspected, including the limitations of tags when tagout systems are used.

The Program Administrator will certify that the periodic inspections have been performed. The certification will identify the machine or equipment on which the energy-control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

6.1 PLAN REVIEW AND UPDATE

This program will be reviewed and updated by the Program Administrator whenever:

- The program fails;
- There is a change in LOTO procedures or in machinery or equipment; or
- The LOTO regulations change.

7.0 RECORD KEEPING

Each department shall maintain records of the following:

1. A copy of this program;
2. Specific Lockout / Tagout procedures for equipment and machinery (found in their department);
3. Training records; and
4. Documentation of program violations.

This documentation shall be updated as new equipment or procedures are added. All updates shall be communicated to the Program Administrator.

APPENDIX A

DEFINITIONS

Authorized Employee	A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.
Affected Employee	An employee whose job requires him or her to operate or use a machine or equipment on which servicing or maintenance is being performed under Lockout/Tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.
Other Employee	A person who works near machines or equipment during servicing or maintenance.
Energy-Isolating Device	A mechanical device that physically prevents the transmission or release of energy, including, but not limited to, the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors; a line valve; a block; and any similar device used to block or isolate energy. <i>Push buttons, selector switches, and other control circuit-type devices are not energy-isolating devices.</i>
Energy Source	Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
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. Included are blank flanges and bolted slip blinds.
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.
Tagout Device	A prominent warning device, such as a tag and a means of attachment, 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 being controlled may not be operated until the tagout device is removed.
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.

APPENDIX B

SOUTHERN MAINE COMMUNITY COLLEGE LOCK OUT TAG OUT PROGRAM AUTHORIZED EMPLOYEES

Department

Job Title of Authorized Individual

Environmental Health & Safety

Coordinator

Facilities Management

Facilities and Project Manager
Facilities Supervisor Daily Operations
Facilities Supervisor Maintenance/Trades/Labor
Electrician
HVAC Technician
Maintenance Mechanic

Academic Department

Chair

APPENDIX C

LOTO DEVICE INVENTORY

South Portland

Facility Maintenance Shop Kit

- 3-locks with keys
- 1-Securing cord
- 2- gate valve devices
- 1- ball valve devices
- 1-110v plug device
- 1- multi lock hasp
- 2- no –tool circuit breaker
- 2- plug locks
- 2- wall switch
- Tags

HVAC Van

- 3-locks with keys
- 2-Securing cords
- 3- multi lock hasps
- 2- gate valve devices
- 1- ball valve device
- 4- plug locks
- 2- wall switches
- 1- no-tool circuit breaker
- Tags
- 2- LOTO magnets
- 1- multipole breaker lock

Electrician Van

- 3- locks with keys
- 10 –small brass locks with individual keys
- 2- multi lock hasps
- 1- plug end canister
- 2- small clamp on breaker/with cleats
- 2- medium clamp on breaker/with cleats
- 1- large clamp on breaker
- 1- multipole breaker device
- 4- snap on breaker device
- Tags

MIDCOAST CAMPUS

MATEC Building Two (2) wall mount kits each containing:

- Tags

- 6- locks with keys
- 1- Prinzing ball valve device
- 2- Gate valve device
- 3- universal multipole breaker device
- 2- 3-in-1 plug device
- 2- wall switch device
- 2- clamp on breaker devices
- 2- no tool circuit breaker device
- 4- multi-lock hasps

APPENDIX D

LOCKOUT VIOLATION RECORDS

Employees trained in the lockout process (authorized or affected agents) must follow lockout procedures as trained. Failure to follow the lockout procedures and/or violation or tampering of lockout equipment can result in disciplinary action.

These guidelines have been developed to ensure the safety of personnel under the Lockout Program.

Date	Name of Employee	Violation	Action Taken

APPENDIX E

SOUTHERN MAINE COMMUNITY COLLEGE EQUIPMENT SPECIFIC LOCKOUT PROCEDURE

Machine or Equipment Type: _____

Location: _____ Equipment ID # _____

Date Procedure Created _____

Verified By _____ Date _____

Step #1: Submit work order to Facilities for Lock Out Tag Out: receive approval

Step #2: Notify all affected employees in the area

Step #3: Blocking of Potential Mechanical Energy *(Delete if not applicable)*

Step #4: Follow Shutdown Procedure: *(Outline shutdown procedure below)*

a. Turn engine "Off" remove ignition key.

b. Release air pressure if equipped.

c. See owner's manual for special shutdown procedures for performing various tasks.

Step #5: Isolation of Power Sources *(list isolation location for each applicable:*

Pneumatic, electric, hydraulic, heat, mechanical)

Step #6: Bleeding of Potential Energy *(list as applicable)*

Step #7: Verification Test *(fill out table below)*

Lockout to Verify	Controls to try:	Process to verify Lockout

All controls must be returned to the "Off" position after the "Verification Test" process.

Step #8: Perform necessary maintenance

Step #9: After maintenance is completed, reverse procedure

APPENDIX F

LOCK REMOVAL FORM

Due to Absence

General Information:	
Date & time of initial request to remove lock:	Work unit of lock owner:
Name of lock owner whose lock is to be removed:	Name of lock owner's supervisor:
Equipment & location:	
Is it absolutely necessary for the equipment to be reenergized before the lock owner can return to personally remove the lock? Yes No If "Yes", explain why:	

Document Reason for Removing Lock: (Lock owner called in sick, lock owner forgot to remove lock before leaving site, etc.)

Document attempts to contact lock owner prior to removal:		
Date & Time	Method of Attempted Contact	Result

Lock Removal:	
<input type="checkbox"/> Verify that the lock will be removed by the supervisor of the lock owner or the supervisor's direct designee.	
<input type="checkbox"/> Verify that the supervisor of the lock owner or the supervisor's direct designee has reviewed the equipment to ensure that it can be safely reenergized.	
Lock removed by:	Date & time of removal:

Notifications:
<input type="checkbox"/> Verify that employee has been informed (i.e. via e-mail or phone call/message) of lock removal within 24 hours of removal.
<input type="checkbox"/> Verify that lock owner has been informed of lock removal prior to beginning their next shift.

Signature of Lock Owner's Supervisor: _____

