LOCKOUT / TAGOUT PROGRAM

Developed in accordance with the OSHA Control of Hazardous Energy Standard, 29 CFR 1910.147

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SKIDMORE COLLEGE
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CONTROL OF HAZARDOUS ENERGY SOURCE AND ELECTRICAL HAZARDS

LOCKOUT AND TAGOUT

PURPOSE

The purpose of these instructions are to ensure that before any employee performs any servicing or maintenance on machinery or equipment, where the unexpected energizing, start up or release of any type of energy could occur and cause injury, the machinery or equipment will be rendered safe to work on by being locked out or tagged out.

GENERAL INFORMATION

All equipment shall be locked out or tagged out to protect against accidental or inadvertent operation during any servicing or maintenance activity. Anyone operating or attempting to operate any switch, valve, or other energy isolating device that is locked or tagged out will be disciplined.

OSHA has promulgated two standards that require lockout/tagout of machinery and equipment.

They are:

1. Control of Hazardous Energy (Lockout/Tagout) - 29 CFR 1910.147.
2. Lockout/Tagout Electrical Safe Workpractice Standard - 29 CFR 1910.333.

Lockout is the preferred method of isolating machines or equipment from energy sources and shall be used whenever possible. (See pages 7 and 8 for additional requirements for working on electrical circuits.)

If tags are used additional steps shall be taken as may be necessary to provide the equivalent safety available from the use of a lockout device. (See pages 7 and 8 for additional requirements for working on electrical circuits.)

Equipment obtained or modified after January 2, 1990, will be equipped with lockout capability.

The terminology used in this instruction is derived from the OSHA standards.

LOCKOUT/TAGOUT PROCEDURES

This procedure establishes the minimum requirements for the lockout or tagout of energy isolating devices. For your convenience, machines and equipment may be evaluated using the Energy Source Determination Checklist form located in the Lockout/Tagout binder.

A LOG BOOK shall be used under the following conditions:

- Outside contractors perform Lockout/Tagout on any of Skidmore College's equipment.
- A shift change or multi-day equipment repair requiring Lockout/Tagout

The LOTO logs are to be maintained in the Lockout/Tagout binder located in the shop area at Facilities Service, North Hall.

RESPONSIBILITY

Any employees who could be exposed to hazardous energy sources shall be instructed in the safety significance of the lockout or tagout procedure (LOTO). Employees authorized to perform LOTO shall receive training commensurate with their responsibilities and as per the OSHA requirements.

Each new or transferred "affected" employee and "other" employees who work operations are or may be in the area shall be instructed in the purpose and use of the lockout or tagout procedure.

Prior to lockout/tagout, the senior authorized individual will brief all affected employees in person. In the event of tagout system only, the authorized individual will also brief all other personnel potentially exposed to the hazard in person. The procedures noted in the LOCKOUT OR TAGOUT SYSTEM PROCEDURE will be followed.

PREPARATION FOR LOCKOUT OR TAGOUT

The "authorized" employee must locate and identify all isolating devices to be certain which switch(s), valve(s), or other energy isolating devices apply to the equipment to be locked or tagged out. More than one hazardous energy source and/or means of disconnect (electrical, mechanical, chemical, hydraulic, heat, and others) may be involved.

Indicate on Work Order that you are performing a Lockout/Tagout procedure and that all of the following steps were followed.

LOCKOUT OR TAGOUT SYSTEM PROCEDURE

1. **Notify all affected employees** that a lockout or tagout system is going to be utilized and the reason thereof. The authorized employee shall know the type and magnitude of energy that the machine or equipment utilizes and shall understand the hazards thereof.
2. **Shut down energized equipment:** If the machine or equipment is operating, shut it down by the normal stopping procedure. This is usually done by depressing stop button, open toggle switch, etc. In addition, ensure that all stored energy is dissipated or properly restrained.
3. **Isolate energy sources:** Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s).
4. **Apply Lockout/Tagout device:**
    a. Locks or tags shall be affixed to each energy isolating device only by an "authorized" employee.
    b. Locks and tags shall be singularly identified (i.e. name and date printed on lock and tag).
    c. Locks shall be affixed in a manner that will hold the energy isolating devices in a safe or off position.
    d. Tags shall 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 (e.g. DANGER – DO NOT OPERATE).
    e. Tags that cannot be affixed directly to the energy isolating device 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.

f. All potentially hazardous stored or residual energy shall 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 shall continue until the possibility of accumulation no long exists).

5. **Release stored energy:** Live or stored energy may still exist after equipment has been shut down. Ensure hydraulics, air, gas, steam pressure have been bled, stop blocks/gear stops are in place, elevated machine members are blocked, electrical circuits de-energized, etc.
6. **Test and Restart to Verify Zero-Energy State:** After ensuring that no personnel are exposed, as a check on having disconnected the energy sources, operate the push button, check gauges, use test equipment or other normal operating controls to make certain the equipment will not operate.

CAUTION: RETURN OPERATING CONTROL(S) TO "NEUTRAL" OR "OFF" POSITION AFTER THE TEST. The equipment is now locked out or tagged out.

TESTING OR POSITIONING OF MACHINES, EQUIPMENT, OR COMPONENTS THEREOF

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

a. Clear the machine or equipment of tools and materials.
b. Remove employees from the machine or equipment area.
c. Remove the lockout or tagout devices.
d. Energize and proceed with testing or positioning.
e. De-energize all systems and reapply energy control measures.

RESTORING MACHINES OR EQUIPMENT TO NORMAL OPERATION

1. **Clean up and inspect equipment.** Ensure no tools or materials are left in or around the equipment and that the machine/equipment components are operationally intact.
2. **Clear affected personnel away from area.** After the servicing and/or maintenance is complete and equipment is ready for normal operation, check the area around the machines or equipment to ensure that no one is exposed.
3. **Verify that the controls are in neutral**.
4. **Remove all lockout or tagout devices** (ensure all tools have been removed from the machine or equipment, guards have been reinstalled and employees are in the clear).
5. **Reactivate isolation device(s)** to restore energy to the machine or equipment.
6. **Notify the "affected" employees of their removal and startup**.
7. You are now ready to restart machinery or equipment.

PROCEDURE INVOLVING MORE THAN ONE PERSON

In the preceding steps, if more than one individual is required to lockout or tagout equipment, each shall place his/her own assigned lockout device or tagout device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks or tags, a multiple lockout or tagout device (hasp) or may be used. If lockout is used, a single lock may be used to lockout the machine or equipment with the key being placed in a lockout/gang box which allows the use of multiple locks to secure it. Each employee will then use his/her own assigned lock to secure the box. As each person no longer needs to maintain his or her lockout protection, that person will remove his/her lock from the box or cabinet.

REMOVAL OF LOCKOUT/TAGOUT DEVICES BY OTHER THAN THE AUTHORIZED EMPLOYEE

Lockout/Tagout Devices shall be removed from each energy isolating device by the employee who applied it, EXCEPT:

Lockout/tagout devices may only be removed by his/her Supervisor or Department Manager if the authorized employee who applied it is not available and:

a. it is verified that the authorized employee who applied the device is not at the facility;
b. all reasonable efforts were made to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed and;
c. the authorized employee has this knowledge before he/she resumes work at that facility.

INFORMING OUTSIDE CONTRACTORS

Skidmore College will inform all outside contractors of the elements of this program and obtain information regarding their lockout/tagout programs. This information shall be conveyed to our employees in an understandable manner. **The work efforts covered by the procedure shall be fully coordinated and complied with.**

SHIFT OR PERSONNEL CHANGES

While maintenance work is in progress and shift or personnel changes occur, the continuity of LOTO protection must be maintained. In the case of shift or personnel changes, a Changeover Period will be established so that the authorized employees may exchange their assigned locks/tags. Authorized personnel assuming control of lockout of equipment shall be fully briefed in the scope and stage of the work by those whom are being relieved.

If the equipment is the sole responsibility of authorized employees on a single shift, locks and tags shall be left in place until the servicing is complete.

NOTE: The on-coming employee(s) must apply their personal LOTO devices before the off-going employee(s) remove their personal LOTO devices.

If the off-going and on-coming authorized employees cannot meet during a Changeover Period to exchange their LOTO devices, the following procedures must be followed:

The Authorized Employee whose shift is ending must notify his immediate supervisor at least one hour prior to the end of his/her shift indicating that there will be a lapse in time before the next shift arrives.

1. The authorized employee must log all pertinent information into the LOTO Log Book.
2. If a supervisor is not available, the authorized employee in control of the equipment must notify one of the following delegated managers:
    a. the Director of Facilities Services,
    b. the Assistant Director of Facilities Services
    c. the Environmental Health and Safety Officer.
3. Prior to the end of the Authorized Personnel's end of shift, the supervisor (or one of the authorized managers) will assume control of the equipment by affixing departmental lock(s) and/or tag(s) until the next shifts' authorized personnel arrive.
4. At this time, the employee(s) may remove his lock(s) and/or tag(s).

5. When the next shifts' authorized employee(s) arrive, their locks/tags shall assume control of the equipment by affixing their lock(s) and/or tag(s).
6. The supervisor (or one of the delegated managers) will then brief the new shift authorized employees in the scope and stage of the work by those whom are being relieved.
7. The supervisor (or one of the authorized managers) may then remove the departmental Shift-change lock(s) and/or tag(s).

PERIODIC INSPECTIONS

Periodically (at least annually) the effectiveness of the entire program will be evaluated by authorized employee(s) other than the one(s) utilizing the energy control procedure being inspected. Any deviations or inadequacies shall be documented and corrected. The date of the inspection/evaluation will be documented on the Annual Inspection Report and maintained as a part of this program until the next annual evaluation replaces it.

TRAINING

Training shall be given to all authorized, affected and other personnel as required by 29 CFR 1910.147(c)(7) and 29 CFR 1910.332. The Environmental Health & Safety Officer or other qualified person will conduct training and prepare a record and certify that the employee training has been accomplished. The certification will be made on a Training Record. The Environmental Health & Safety Officer or other qualified person will conduct retraining whenever there is:

a. a change in their job assignments,
b. a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or
c. when there is a change in the energy control procedures,
d. additional retraining shall also be conducted whenever the periodic inspection reveals,
e. or whenever there is reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures

ELECTRICAL LOCKOUT/TAGOUT (29 CFR 1910.333(b))

Electrical work requires a lock and a tag to be used together. However, a tag can be used by itself only if the electrical disconnecting source does not have lockout capabilities.
Locks can be placed without a tag only under the following conditions:

1. Only one circuit or piece of equipment is de-energized.
2. The lockout period does not extend beyond the work shift.
3. Employees exposed to the hazards associated with re-energizing the circuit or equipment are familiar with this procedure.

ELECTRICAL TEST VERIFICATION OF DE-ENERGIZED CIRCUITS (29 CFR 1910.333(b)(2)(iv)(B))

A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are de-energized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately before and immediately after this test.

WORKING ON ENERGIZED CIRCUITS

Permit Required. Approval must be obtained from the electricians' immediate supervisor prior to any work on energized circuits. The electricians' immediate supervisor will verify that by de-energizing circuits, it will create additional or increased hazards or it is infeasible due to equipment design or operational limitations.

NOTE: Working on energized parts requires a permit and the wearing of appropriate personal protective equipment. Skidmore's Arc Flash Program will ensure compliance with 29 CFR 1910.335.

Personnel protective equipment for electrical hazards shall meet, be used and maintained in accordance with ANSI J6.1 through J6.7.

ONLY ELECTRICIANS ON THE ABOVE "LIST OF AUTHORIZED LOCKOUT AND TAGOUT INDIVIDUALS" MAY WORK ON ENERGIZED CIRCUITS.

ACCIDENTS CONCERNING LOCKOUT/TAGOUT

The Environmental Health & Safety Officer will be responsible for fully investigating all lockout/tagout accidents, and reporting the cause of such accident to the Safety Committee. If the accident involved the control of hazardous energy with a single lockout source, a specific procedure will be written and included in Appendix F before work is continued.

If the accident involved a specific procedure for a piece of equipment, the lockout/tagout specific procedure will be evaluated and modified (if necessary) prior to authorizing work to continue.

EMERGENCY CONTACTS

NAME	DEPARTMENT	CELL PHONE NUMBER
Daniel Rodecker	**Director of Facilities**	**518-495-5082**
David Nicholson	**Asst. Director of Facilities**	**518-323-2286**
Mark Dugas	**EH&S Officer**	**518-683-5486**
Randall Wright	**Manager – Trades**	**518-932-9016**
Suzanne Coonradt	**Manager – Maintenance**	**518-322-8352**
Gary LaChance	**Manager – Carpenters**	**518-409-2290**
Campus Safety	**Campus Safety**	**518-580-5566 (office)**
Facilities Services	**Facilities Services**	**518-580-5860 (office)**

EXCEPTIONS TO PROCEDURE REQUIREMENTS – 1910.147(c)(4)(i)

A procedure will be developed for the control of potentially hazardous energy for machines and equipment unless (all must apply):

1. The machine or equipment has no potential for stored, residual energy or re-accumulation of stored energy after shut down.
2. The machine has a single energy source that can be readily identified and isolated.

3. The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
4. The machine or equipment is isolated from the energy source and locked out during servicing or maintenance.
5. A single lockout device will achieve a locked-out condition.
6. The lockout device is under the exclusive control of the authorized employee performing the service or maintenance.
7. No other hazards are created.
8. There have been no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.

Cord-controlled devices: 1910.147 (a)(2)iii)(A) Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

LOTO QUICK REFERENCE – IMPLEMENTATION AND RETURNING MACHINE TO NORMAL OPERATION	
When locking out the equipment, follow these LOTO Implementation Steps for each isolation. When restoring the equipment to normal operation, follow the LOTO Clearance Steps to clear each isolation.	
LOTO Implementation Steps	***LOTO Clearance Steps***
1. Preparation: review all hazards and controls and perform full employee briefing.	1. Clean up and inspect equipment. Ensure no tools or materials are left in or around the equipment.
2. Notify affected personnel, verify it is safe to shut down the equipment.	2. Clear affected personnel away from area to ensure that no one is exposed.
3. Isolate energy sources - perform normal equipment shutdown.	3. Verify that the controls are in neutral.
4. Apply LOTO Device - Lock and Tag	4. Remove Locks and Tags.
5. Release Stored Energy if necessary (apply blocks, grounds, etc.)	5. Reactivate isolation device(s) to restore energy to the equipment.
6. Test and Restart to Verify Zero-Energy State	6. Notify the "affected" employees of their removal and startup.
CAUTION: RETURN OPERATING CONTROL(S) TO "NEUTRAL" OR "OFF" POSITION AFTER THE TEST.	7. You are now ready to restart machinery or equipment.