

DEPAUL UNIVERSITY

Lockout/Tagout Program

Environmental Health & Safety

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1.0 PURPOSE

This program outlines the requirements for machines and equipment capable of causing injury due to unexpected energization, startup or the release of stored energy. All machines and equipment that fall within the scope of this program must be locked/tagged out by authorized employees, in accordance with written energy control procedures and all other requirements of this program.

A lockout system is always preferred. Use of a tagout system alone is only allowed when a machine/equipment cannot be physically altered to accept a lockout device.

2.0 SCOPE

This program applies to the control of energy during servicing or maintenance of machines and equipment, which is solely under the jurisdiction of Facility Operations (or contractors they hire) at DePaul University.

Normal production operations are not covered unless an employee is required to:

- Remove or bypass a guard or other safety device
- Place any part of their body into a point of operation or where an associated danger zone exists during a machine operating cycle

Exceptions: Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations are not covered if they are routine, repetitive and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection.

This program does NOT apply to the following:

- 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 unplugging the equipment from the energy source and the plug remains under the exclusive control of the employee performing the servicing/maintenance.
- 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 that the employer demonstrates that continuity of service is essential; shutdown of the system is impractical; and documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

3.0 RESPONSIBILITIES

3.1 Facility Operations

Facility Operations (FO) is responsible for evaluating areas under its administrative control to determine the machines and equipment to which this program applies, developing written energy control procedures and inspecting them in use annually as well as providing the equipment needed to control hazardous energy.

3.2 FO Managers & Supervisors

FO managers and supervisors are responsible for the designation of authorized and affected employees, ensuring that they receive proper training and maintaining training and annual inspection records.

3.3 Authorized & Affected Employees

These employees are responsible for observing all practices and procedures described in this program, attending required training and reporting any unsafe conditions to their supervisors.

3.4 Environmental Health & Safety

Environmental Health & Safety (EHS) is responsible for assisting Facility Operations in the implementation of this program and maintaining copies of training records.

4.0 TRAINING

There are 2 types of employees under this program: Authorized and affected, for which training requirements differ.

TYPE OF EMPLOYEE	DESCRIPTION	TRAINING REQUIREMENTS
Authorized employee	Designated by FO to perform energy control procedures.	<ul style="list-style-type: none"> -Knowledge and skills necessary for the safe application, usage and removal of energy controls. -Ability to recognize applicable hazardous energy sources. -Information on the type and magnitude of energy available in the workplace. -Methods and means necessary for energy isolation and control.
Affected employee	<ul style="list-style-type: none"> -Work in an area where energy control procedures are used. -Work on machines/equipment that are subject to lockout requirements. 	<ul style="list-style-type: none"> -The purpose and use of energy control procedures. -The knowledge that machines/equipment which are locked out may not be started or energized.
	If duties are expanded to include servicing/maintenance on machines/equipment that are locked out, an affected employee is also an authorized employee.	

4.1 Retraining

Retraining must be provided for all authorized and affected employees whenever there is a change that affects energy control procedures (e.g., job assignments, machines, equipment, processes, etc.). Retraining must also be conducted whenever an annual inspection reveals, or a manager or supervisor has reason to believe there are deviations from or inadequacies in an employee's

knowledge or use of energy control procedures. The retraining must introduce new or revised methods necessary to reestablish employee proficiency.

5.0 GENERAL ENERGY CONTROL PROCEDURE

The following elements and actions must be included in written energy control procedures for all machines/equipment that require them, although the specifics will vary. They must be performed in the following sequence by an authorized employee.

1. Preparation

The authorized employee must have knowledge of the type, magnitude and hazards of the energy to be controlled and the method/means of control before shutdown.

2. Notification

Notify affected employees of the application of lockout/tagout (LOTO) devices prior to applying them.

3. Shutdown

The machine/equipment must be shut down by the normal stopping procedure and in a manner that avoids creating any increased or additional hazards.

4. Isolation

Apply all energy isolating devices needed to control the energy to the machine/equipment in such a manner as to isolate the machine/equipment from all energy sources.

5. Device Application

Affix LOTO devices (conforming to Appendix B requirements) to each energy isolating device.

6. Release stored energy

Disconnect and drain all stored electrical, gravitational, mechanical and/or thermal energy to a zero-energy state or otherwise made safe by blocking or repositioning of equipment. This can be accomplished by:

- Releasing pressured lines such as hydraulic, air, steam, gas and water
- Releasing spring-loaded equipment
- Blocking mechanical equipment with moving, rotating or elevated parts

7. Verification

Verify that the system is isolated. This is generally accomplished by first establishing that no personnel are exposed and then turning the switch to the ON position using normal operating controls.

If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing/maintenance is completed, or until the possibility of such accumulation no longer exists.

8. Servicing/Maintenance

Perform the servicing/maintenance.

9. Release from Lockout/Tagout

Once servicing/maintenance is completed, the authorized employee who attached each LOTO device is responsible for promptly removing it (see exception below for instances where this is not feasible) after completing the following actions:

1. Inspect the work area: Ensure that the machine/equipment is fully assembled and operational, all tools and nonessential items are removed and all safety guards are back in place.
2. Ensure that all employees are clear of the machine/equipment.
3. Remove LOTO devices.
4. Notify affected employees that LOTO devices have been removed and the machine/equipment will be reenergized.
5. Reenergize the machine/equipment.

Exception: If the following steps are taken by the supervisor in charge, a device may be removed by someone else.

- Verify that the person who attached the device is not at the facility.
- Make all reasonable efforts to notify the person that their device has been removed.
- Ensure the person is aware of their device's removal before resuming work at the facility.

5.1 Temporary Release for Testing or Positioning

If a machine/equipment must be temporarily energized during servicing/maintenance for testing or positioning, the temporary removal of LOTO devices and subsequent re-energization must follow this sequence:

1. Clear machine/equipment of tools and other miscellaneous materials.
2. Remove all employees from the area.
3. Remove LOTO devices.
4. Energize and proceed with testing or positioning.
5. De-energize and reapply LOTO devices.

5.2 Shift or Personnel Changes

When servicing/maintenance extends beyond one work shift, a procedure must be in place to transfer control of the machine/equipment to the arriving shift. This transfer is the responsibility of all departing and arriving shift supervisors involved with the project. Responsibilities include:

- Overseeing the transfer of control from existing LOTO devices to separate devices.

- Ensuring continuity of the energy control procedure is maintained until the arriving supervisor has taken full control of the project.

6.0 ANNUAL INSPECTIONS

Each energy control procedure in place must be inspected in use at least annually by an authorized employee to correct any deviations or inadequacies identified.

The inspection must include a review, between the inspector and each authorized employee, of that authorized employee's responsibilities under the energy control procedure being inspected.

7.0 CONTRACTORS

When a contractor is hired to perform work covered by this program, Facility Operations and the contractor must inform each other of their respective energy control procedures.

The Facility Operations supervisor in charge must ensure that their employees understand and comply with the restrictions and prohibitions of the contractor's energy control program.

8.0 DOCUMENTATION

Records must be kept of all training and annual inspections required by this program.

- Training records must contain employees' names, dates of training and the content.
 - Copies of training records must be sent to EHS in a timely manner.
- Annual inspection records must identify the machine/equipment on which the energy control procedure was utilized, the date, names of the inspector and employees involved in the inspection.

APPENDICES

APPENDIX A: DEFINITIONS

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

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. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out. An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized. Connected to an energy source or containing residual or stored energy.

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, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap. A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

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.

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.

Normal production operations. The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance. Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy.

Setting up. Any work performed to prepare a machine or equipment to perform its normal production operation.

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.

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.

APPENDIX B: DEVICE REQUIREMENTS

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners or other hardware (i.e., LOTO devices, referred to simply as “devices” in this Appendix) must be provided at no cost to employees for the purpose of isolating, securing or blocking of machines or equipment from energy sources.

Devices must be uniquely identified, the only device used for controlling energy and not used for other purposes. They must also be durable, standardized, substantial and identifiable as detailed below:

- **Durable:** Devices must be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
- **Standardized:** Devices must be standardized in color, shape or size. Print and format should be standardized.
- **Substantial:** Devices must be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
- **Identifiable:** Devices must indicate the identity of the employee applying them.

APPENDIX C: GROUP LOCKOUT/TAGOUT

A group LOTO is necessary when servicing/maintenance is performed by more than one individual. A specific procedure must be developed for this situation. Group LOTO can be accomplished through the use of a lockout device that accepts multiple locks or a group lock box (stores all keys to locks used and can only be opened by one individual). One person from the group should be selected to oversee the LOTO procedure. The group representative will be responsible for:

- Affixing the group lockout device or maintaining control of the lock box.
- Ensuring that procedures are followed, including verifying that equipment is de-energized.
- Continually monitoring the work to ensure that employees on the crew are not exposed to LOTO hazards.
- Verifying that all procedures for returning the equipment back into service are completed before LOTO devices are removed.

ACKNOWLEDGEMENTS

29 CFR 1910.147 and Interpretations

NFPA 70E

OSHA Instruction; Compliance Directive (https://www.osha.gov/OshDoc/Directive_pdf/CPL_02-00-147.pdf)

<http://www.oshatraining.com/ClarifyingOSHAAnnualLockoutTagoutProcedureInspectionRequirement.php>

<http://www.uta.edu/campus-ops/ehs/occupational/docs/loto-manual.pdf>