

Lockout/Tagout Procedure

Overview:

In order to provide a safe environment for workers, the following policies and procedures have been developed to prevent injury and or fatalities within the workplace. This policy is established taking into account the requirements of the Ontario Electrical Safety Code and the Occupational Health and Safety Act as amended from time to time. Because of the potential for serious injury or loss of life, failure to adhere to this policy may result in discipline up to and including discharge.

Applicable Legislation:

Legislation pertaining to these guidelines can be found in the Regulations for Industrial Establishments under the Occupational Health and Safety Act of Ontario.

Occupational Health and Safety Act (OHSA), R.S.O. 1990

O. Reg. 851, R.R.O. 1990, Industrial Establishments, Sections 42,43,75,76

42. (1) The power supply to electrical installations, equipment or conductors shall be disconnected, locked out of service and tagged before any work is done, and while it is being done, on or near live exposed parts of the installations, equipment or conductors.

42. (2) Before beginning the work, each worker shall determine if the requirements of subsection (1) have been complied with.

42. (3) Locking out is not required.

(a) if the conductors are adequately grounded with a visible grounding mechanism; or

(b) if the voltage is less than 300 volts and there is no locking device for the circuit breakers or fuses and procedures are in place adequate to ensure that the circuit is not inadvertently energized.

42. (4) If locking out is not required for the reason set out in clause (3)(b), the employer shall ensure that the procedures required by that clause are carried out.

42. (5) If more than one worker is involved in the work referred to in subsection (1), the worker who disconnected and locked out the power supply shall communicate the purpose and status of the disconnecting and lockout.

42. (6) If a tag is used as a means of communication, the tag,

(a) shall be made of non-conducting material;

(b) shall be secured to prevent its inadvertent removal;

(c) shall be placed in a conspicuous location;

(d) shall state the reason the switch is disconnected and locked out;

(e) shall show the name of the worker who disconnected and locked out the switch; and

(f) shall show the date on which the switch was disconnected and locked out

42. (7) The employer shall establish and implement written procedures for compliance with this section.

43. Tools and other equipment that are capable of conducting electricity and endangering the safety of any worker shall not be used in such proximity to any live electrical installation or equipment that they might make electrical contact with the live conductor.

75. A part of a machine, transmission machinery, device or thing, shall be cleaned, oiled, adjusted, repaired or have maintenance work performed on it only when,

- (a) motion that may endanger a worker has stopped; and
 (b) any part that has been stopped and that may subsequently move and endanger worker has been blocked to prevent its movement.

76. Where the starting of a machine, transmission machinery, device or thing may endanger the safety of a worker,

- (a) control switches or other controlling mechanisms shall be locked out; and
 (b) other effective precautions necessary to prevent any starting shall be taken.

Purpose:

This policy describes methods of ensuring that equipment is immobilized and isolated prior to carrying out maintenance work and to ensure that authorized or unauthorized personnel inadvertently re-energizes or releases stored energy in equipment before all workers are safe. The primary aim of this lockout program is to promote equipment users and those who repair them, to achieve a zero energy state in equipment before performing any kind of repair or preventative maintenance. A zero energy state can be defined as: the condition in which a machine, equipment, tool or electrical installation is rendered incapable of spontaneous or unexpected action or otherwise releasing kinetic or potential energy.

While a majority of lockout/tagout situations are electrical it is by no means the only energy source that requires attention. For a listing of potential energy forms and sources see figure 1.0 to aid in identifying energy sources in your area. Each department or area on campus presents unique conditions and equipment varies from department to department, it is therefore essential that each department identify and develop their own lockout/tagout procedures for their particular equipment. What follows is a generalized method for conducting lockout/tagout procedures.

Figure 1.0

ENERGY FORM	ENERGY SOURCE	GENERAL LOCKOUT GUIDELINE
Electricity	power transmission lines; machine power cords; motors; solenoids; capacitors (stored electrical energy)	Turn off power at machine first (i.e., at point of operation switch), and then at the main disconnect switch for the machine; lock and tag main disconnect switch (or remove fuses from box, and then lock and tag box). Fully discharge all capacitive systems (e.g., cycle machine to drain power from capacitors) according to manufacturer's instructions.
Fluid pressure	hydraulic systems (e.g., hydraulic presses, rams, cylinders, hammers)	Shut off, lock (with chains, built-in lockout devices, or lockout attachments) and tag valves; bleed off and blank lines as necessary.
Air pressure	pneumatic systems (e.g., lines, pressure reservoirs, accumulators, air surge tanks, rams, cylinders)	Shut off, lock (with chains, built-in lockout devices, or lockout attachments) and tag valves; bleed off excess air; if pressure cannot be relieved, block any possible movement of machinery.
Kinetic energy	blades; flywheels; materials in supply lines of bins or silos	Stop and block machine parts (e.g., stop flywheels and ensure that they do not recycle); review entire cycle of mechanical motion, ensure that all motions are stopped. Block material from moving into area of work;

		blank as required.
Potential energy	springs (e.g., in air brake cylinders); actuators; counter weights; raised loads; top or movable part of a press or lifting device	If possible, lower all suspended parts and loads to the lowers (rest) position, block parts that might be moved by gravity; release or block spring energy.
Pressurized liquids and gases	supply lines; storage tanks and vessels	Shut off, lock (with chains, built-in lockout devices, or lockout attachments) and tag valves; bleed off excess liquids or gases; blank lines as necessary.

Adapted from the “Lockout” Industrial Accident Prevention Association Program (2000).

General Guidelines and Procedures

Identify Lockout Situations and Energy Sources

Assess equipment energy sources (figure 1.0), either potential or kinetic and determine the most effective method to achieve a “ZERO ENERGY STATE”. Contact Physical Plant maintenance staff to help identify system shutdown procedures.

Notify Persons Affected

Once energy sources have been isolated, notify affected personnel of the shutdown.

Shutdown and Security Procedures

Follow proprietary equipment and system shutdown procedures and return equipment to a “ZERO ENERGY STATE” by methods described under “General Lockout Guidelines” in Figure 1.0. Apply Lock and Tag



Information. **Lockout Tag**

Verify Effectiveness of Lockout

Ensure that all equipment energy sources are re-tested and are resting in a “ZERO ENERGY STATE” position. Use equipment specified testing devices or related procedures for system shutdown confirmation such as Digital Multi-Meter’s (DMM), pressure gauges, blocks, bleeding devices or cycling systems procedures.

Lockout Mechanisms and Tags

Locks

- Each worker will shall obtain his/her own individually keyed lock. This is the workers own safety equipment and is not to be loaned. (No duplicate or master keys).
- When projects are multi-departmental and involve more than one person use a multi-hinged hasp lockout device.

Tags

Lockout tags should include the following information:

- Date, Time.
- Workers Name(s).
- Department(s).
- Reason why equipment has been disconnected

Devices used to Lockout equipment



Example Lockout and Tagout Process used by Physical Plant

1. Each worker will be given his/her own individually keyed lock. This is the workers own safety equipment and is not to be loaned. (No duplicate or master keys).
2. Machine operator shall shut down the machine in the normal manner.
3. Person in charge tests the start button.
4. If work is to be performed on electrical circuits or equipment, a qualified person shall first test for electrical potential with a proven meter.
5. Person in charge puts hasp on switch with own personal lock and then adds completed tag to lock.
6. Tag shall state: reason why switch is disconnected, name of worker who disconnected and locked, date when switch was disconnected and locked.
7. Each person who works on the machine shall be protected by placing his/her own lock and tag on the hasp

attached to disconnect switch.

8. The key is to be kept on his/her person.

9. After work is completed, worker shall check equipment and immediate area for hazards before removing his/her lock.

10. Locks may not be removed by anyone other than the worker who placed it on the switch (ABSOLUTELY NO EXCEPTIONS).

11. If a person goes home without removing his/her lock, he/she will be called at home to return to the University to remove their lock, without compensation.

12. If equipment is to be locked-out overnight a system lock (coloured red) is to be installed and a completed tag attached to the lock stating; reason why switch is disconnected; name of worker who disconnected and locked; date when switch was disconnected and locked.

13. No one is to remove a system lock until all conditions of the tag-out has been met or a worker is placing his/her own lock on to complete work on equipment.

14. System locks can be obtained in the following areas;

CUB (by time clock)

H-Block Mechanical Room

Schmon Tower Mechanical Room

Faculty of Ed. Mechanical Room

Thistle Mechanical Room

Phys. Ed. Mechanical Room

Taro Mechanical Room

15. Any worker taking a system lock should fill in the sign-out sheet.

16. If a worker is unsure as to lockout procedure, he/she should seek direction from their supervisor before proceeding.