



UNIVERSITY OF TORONTO

Lockout/Tagout Standard

In University workplaces, the various forms of energy associated with machinery and equipment have the potential for causing severe injuries, including electrocution, burns, chemical exposures, cuts, bruises, crushing, amputation or death. To protect workers from the hazards associated with the inadvertent or accidental start-up of such machinery and equipment during servicing, maintenance or other activities, specific lockout/tagout procedures to control potentially harmful energy sources must be implemented. This standard is based on the American National Standards Institute (ANSI) Standard Z244.1-2016 "Control of Hazardous Energy Lockout Tagout and Alternative Methods", the Canadian Standards Association (CSA) Standard Z460-13 (R2018), "Control of Hazardous Energy - Lockout and other Methods", and requirements under the Ontario Occupational Health and Safety Act and applicable Regulations (R.R.O 1990 Reg. 851 Industrial Establishments; O. Reg. 213/91 Construction Projects; O.Reg. 632/05 Confined Spaces).

1.0 SCOPE:

Any situation which may expose a worker to the hazards of unexpected energization, start-up or release of stored energy of a machine, equipment, device or process at the University of Toronto.

Note: In this standard, "worker" includes faculty, staff, contractors, students and visitors.

This program applies to various forms of hazardous energies (e.g., hydraulic, pneumatic, etc.). For additional procedures on electrical energy, its hazards and controls, please refer to the [U of T Electrical Safety Program](#) for more information.

2.0 RESPONSIBILITIES:

Principal investigators, supervisors and all others in authority shall:

- Identify situations where lockout/tagout procedures are required to isolate energy sources when work is being conducted on machinery or equipment;
- Develop, document, and implement appropriate measures to isolate and lock/tag out; potentially harmful energy sources on machinery and equipment by using this standard or in conjunction with the Office of Environmental Health and Safety;
- Develop and maintain written lockout/tagout procedures that are machine or equipment-specific by reviewing drawings and technical maintenance manuals; where applicable, considerations should be made for local site-specific conditions and procedures;
- Provide and maintain necessary equipment, tools and materials for lockout and tagout procedures, including padlocks, tags, signs, chains or seals;
- Ensure that workers authorized to conduct service or maintenance work on machinery and equipment receive appropriate training in lockout/tagout procedures;
- Ensure that other affected workers are informed that attempts to use, restart, or re-energize machines or equipment that are locked or tagged out are prohibited;
- Ensure, by regular inspection, that appropriate lockout/tagout procedures have been implemented by authorized workers to isolate and lock out energy sources prior to service or maintenance work;
- Ensure contractors, when engaged, are aware when Lockout Tagout is required. Ensure contractors are trained in lockout procedures and work in accordance with lockout/tagout procedures that meet or exceed the University of Toronto's Standard and Procedures; and
- Conduct periodic reviews of lockout/tagout procedures to ensure that they are appropriate to the processes and machinery/equipment involved.

Workers shall:

- Work in accordance with established lockout/tagout procedures for machinery and equipment;
- Not attempt to use, start or energize machinery or equipment that is locked or tagged out; and
- Bring to the attention of their supervisor any new conditions that may negatively impact the process and where assigned, assist/participate in the development, maintenance, and feedback of LOTO procedures.

3.0 LOCKOUT TAGOUT

3.1 General Principles of Lockout Tagout System

- Supervisors are to identify all possible hazardous situations and how they can lead to harm during various phases of the machine/equipment/process life cycle. Systematically identify the tasks to be performed as well as the hazards associated with these tasks and if full zero energy state is practicable. Perform a risk assessment for other control methods as needed.
- Where lockout is the method of hazardous energy control, ensure that all energy-isolating devices used to control sources of hazardous energy are capable of being locked out. Examples of effective isolating devices include levers with aligning lock tabs (holes), valves with aligning lock holes, locking covers that work only when the switch is in the safe position, wheels with locking tabs and position indicators, and physical blocks with lockable aligning tabs.
- For each unique machine, piece of equipment, or process, detailed lockout procedures for the control of hazardous energy for all activities must be developed, posted and available.
- Where a facility has two or more pieces of similar equipment or process lines, a single lockout procedure may be applied to all of the similar or identical pieces of equipment, machines or process lines.
- All workers involved in a lockout tagout system must be trained as an Authorized employee and follow procedures established for lockout tagout.
- Each Authorized employee involved in activities requiring lockout must be knowledgeable about the hazards associated with the machine, equipment or process to be isolated and the isolation required to ensure their protection. Each individual must be accountable for ensuring before work begins that energy-isolating device have been placed in the required positions and locked with their personal lock. Individual locks and tags must be applied and removed by each worker exposed to the potential for unexpected release of energy when performing lockout tagout.
- The locks and tags used must be recognizable as part of the method of locking out hazardous energy sources. Locks and tags as part of the lockout system must not be used for any purpose other than personal protection.
- Locks must be purchased specifically for lockout applications. They must be of such design and durability that removal by other than normal means requires excessive force or unusual techniques.
- Where equipment is lockable, use of a lock and tag must be required of all exposed workers.
- When equipment is not lockable, special hazardous energy control procedures must be used following a risk assessment.

3.2 General Requirements for Lockout/Tagout Procedures

The unexpected energization, start-up or release of stored energy during operation, servicing or maintenance work (e.g. inspection, repair, adjustment, cleaning), on machinery or equipment can lead to serious worker injuries. To prevent accidental release or transmission of energy, appropriate procedures must be implemented to deactivate the specific machine or equipment, to isolate it from its energy source (zero energy state), and to lock and tag out the energy isolating device (e.g. breaker, switch, valve, blocks, disconnect switch).

Written lockout/tagout procedures specific to a particular machine or equipment, or to a similar grouping of machines or equipment, must outline the situations in which they are to be used, and the sequence in which they are to be used.

Lockout/tagout procedures shall clearly define the specific actions and responsibilities required during each of the following energy control sequences:

1. Preparation for shutdown

2. Equipment shutdown
3. Equipment isolation from the energy source
4. Application of lockout/tagout devices
5. Release of stored energy, de-energization
6. Verification of isolation
7. Release from lockout/tagout control once work is completed, including removal of lockout/tagout devices and restoration of energy to machinery/equipment.

Example of General Procedure for Lockout Tagout is provided in **Lockout/Tagout: General Procedures**

3.3 Training and Education

Workers who are required to perform lockout for the control of hazardous energies, and their supervisors must be appropriately trained in Lockout Tagout to become an Authorized employee. An Authorized employee is an employee who is qualified because of knowledge, training, and experience and has been assigned to perform lockout.

All workers involved in a lockout tagout system must be trained and follow procedures established for lockout tagout:

- a) General Lockout Tagout Training must be provided to workers before assignment to ensure that workers understand the purpose and function of the lockout tagout system. EHS provides in-class general Lockout Tagout Training (EHS527 Lock out Tag out), available for registration at [My EHS Training](#).
- b) Department specific equipment and/or process specific training must be provided to workers before assignment to ensure workers understand methods and means necessary to perform the lockout tagout for the equipment they are working with.
 - a. Specific training can be developed using applicable manufacturer's documentation, industry best practice, regulatory requirements and input from authorized individuals.
 - b. Training should also include other hazards that may be present (i.e. noise, vibration, ergonomics, lighting, etc.)
 - c. Training should be documented.

3.4 Contractors

When Contractors or other outside workers are performing service or maintenance where it has been determined that lockout is required:

- The supervisor for that area shall ensure that the Contractor is aware and understands the University of Toronto lockout procedures. Contractors must come trained in lockout procedures that meet or exceed the University of Toronto Lockout Standard and procedures.
- The Contractor and supervisor for that area must both work together to determine their relationship, responsibilities and obligations regarding hazardous energy control and lockout before the Contractor starts work.
- Before locking out any equipment, the Contractor shall inform the supervisor of the area of the need for lockout, the location and the expected duration of the lockout.
- Where there is integration of job tasks, coordination must be made between the supervisor of the area and the Contractor to protect all individuals who could be exposed to hazardous energies.