

Lock-out / Tag-out Program

Safety & Security Services

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ALGONQUIN
COLLEGE

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1.0 GLOSSARY

Affected employee - An employee who performs the duties of his or her job in an area in which the energy control procedure is implemented and servicing or maintenance operations are performed. An affected employee does *not* perform servicing or maintenance on machines or equipment and, consequently, is not responsible for implementing the energy control procedure. An affected employee becomes an "authorized" employee whenever he or she performs servicing or maintenance functions on machines or equipment that must be locked or tagged.

Authorized employee - An employee who performs servicing or maintenance on machines and equipment. Lockout or tagout is used by these employees for their own protection.

Capable of being locked out - An energy-isolating device is considered capable of being locked out if it meets one of the following requirements:

It is designed with a hasp to which a lock can be attached;

It is designed with any other integral part through which a lock can be affixed;

It has a locking mechanism built into it; or

It can be locked without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

Energized - Machines and equipment are energized when (1) they are connected to an energy source or (2) they contain residual or stored energy.

Energy-isolating device - Any mechanical device that physically prevents the transmission or release of energy. These include, but are not limited to, manually-operated electrical circuit breakers, disconnect switches, line valves, and blocks.

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

Energy control procedure - A written document that contains those items of information an authorized employee needs to know in order to safely control hazardous energy during servicing or maintenance of machines or equipment. (A more comprehensive explanation is given beginning on page 6.)

Energy control program - A program intended to prevent the unexpected energizing or the release of stored energy in machines or equipment on which servicing and maintenance is being performed by employees. The program consists of energy control procedure(s), an employee training program, and periodic inspections.

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 - Any device that uses positive means such as a lock, either key or combination type, to hold an energy - isolating device in a safe position, thereby preventing the energizing of machinery or equipment. When properly installed, a blank flange or bolted slip blind are considered equivalent to lockout devices.

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 - Any prominent warning device, such as a tag and a means of attachment, that can be securely fastened to an energy - isolating device in accordance with an established procedure. The tag indicates that the machine or equipment to which it is attached is not to be operated until the tagout device is removed in accordance with the energy control procedure.

Zero Energy State – The mechanical potential energy in all elements of a machine is eliminated so that operation of any control will not produce a movement that could cause injury or damage to the machine.

1.1 ACRONYMS

LOTO:	Lockout / Tagout
OH&S Act:	Occupational Health and Safety Act
JOHSC:	Joint Occupational Health and Safety Committee

2.0 PREAMBLE

The purpose of this program is to prevent injuries to employees from the unexpected energizing, start-up, or release of stored energy from machines, equipment, or processes when such employees are engaged in activities where they are at risk from these hazardous sources. This program requires departments, to establish and implement procedures for affixing the appropriate lockout/tagout devices to energy isolating devices, and to otherwise disable machines, equipment, or processes to prevent unexpected energizing, start-up, or the release of stored energy.

3.0 SCOPE

This program applies to all staff who are required to perform maintenance or routine service on equipment or machinery that may contain or produce an energy source that could cause harm to personnel or equipment by transferring or generating electrical energy; hydraulic; pneumatic; gas or steam pressure; vacuum; high temperature; or stored mechanical energy. This lockout / tagout program applies to all departments within the college.

All contractors who are hired by Algonquin College to maintain or service machinery or equipment must implement similar procedures that afford equal or greater protection of contract employees.

4.0 REFERENCES

McMaster University, Lockout/Tagout Program
Occupational Health and Safety Act – Industrial Establishments
OSHA 29 CFR 1910.147, Control of Hazardous Energy (Lockout/Tagout)
Guide to Good Practices for Lockouts and Tagouts. (U.S. Doe – STD-1030-96)

5.0 RESPONSIBILITIES

5.1 Role of Directors, Deans, Chairs, Managers, Supervisors:

- Provide the resources and direction necessary to ensure that an effective lockout / tagout program is in place and is strictly adhered to;
- Ensure that only authorized persons, trained in lockout / tagout procedures, service and maintain machinery or equipment that may contain or produce an energy source that could cause harm to personnel or equipment by transferring or generating electrical energy; hydraulic; pneumatic; gas or steam pressure; vacuum; high temperature; or stored mechanical energy at the college.

- Provide approved lockout / tagout equipment and hardware i.e. locks, tags, multiple lock holders.
- Ensure all affected persons are notified when equipment and machinery is being locked out.
- Ensure that contractors or subcontractors follow the requirements of the lockout / tagout program.

5.2 Role of Authorized Person:

- Work in compliance with the colleges lockout / tagout program.
- Ensure the security of their personal locking devices.
- Follow all documented lockout / tagout procedures.
- Ensure that all relevant information is shown on the lockout tag i.e. reason for lockout, date of lockout and name of authorized person.

5.3 Role of Contractor:

- Any Company / Individual contracted by the college to service and/or maintain machinery or equipment shall follow strict adherence lockout / tagout procedures.

5.4 Role of OHS Section:

- Provide the resources and direction necessary to ensure that an effective lockout / tagout program is in place and is strictly adhered to;
- Coordinate appropriate training for College employees.
- Consult on specific lockout / tagout procedures as required.
- Review and update the lockout / tagout program on an annual basis.

6.0 LOCKOUT /TAGOUT PROCEDURES

6.1 General Rules for Lockout / Tagout

- Implementation of lockout/tagout shall be performed only by authorized employees
- Before any employee performs any maintenance or repair of a machine or equipment where unexpected start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated, and rendered inoperative
- If an energy isolating device is capable of being locked out, then this program requires that a lockout and tagout be utilized. If an energy isolating device is not capable of being locked out, then a tagout shall be utilized.
- Whenever major replacement, repair, renovation or modification of machines or equipment is performed, and whenever new machines or

equipment are installed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device.

6.2 Preplanning for Lockout (Preparation for Shutdown)

- An initial survey shall be made to determine which switches, valves, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or others) may be involved. Any questionable identification of sources shall be cleared by the employees with their supervisors. Before lockout commences, job authorization should be obtained from the supervisor.
- Only supervisors or authorized individuals shall prescribe the appropriate duties and responsibilities relating to the details of effecting the lockout/tagout. Energy isolating devices shall be operated only by authorized individuals or under the direct supervision of authorized individuals. Where high voltages greater than 300V are involved, the supervisor electrician shall be responsible for turning off the main power controls.
- All energy isolating devices shall be adequately labeled or marked to indicate their function. The identification shall include the following:
 1. equipment supplied
 2. energy type and magnitude
- Where system complexity requires, a written sequence in checklist form should be prepared for equipment access, lockout/tagout, clearance, release, and start-up.

6.3 Lockout/Tagout Procedure

1. **Preparation** - Notify all affected employees that a lockout is required and the reason therefore.
2. **Machines or Equipment Shutdown** - If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.). Disconnect switches should never be pulled while under load, because of the possibility of arcing or even explosion. Personnel knowledgeable of equipment operation should be involved with shut down or re-start procedures.
3. **Machine or Equipment Isolation** - Operate the switch, valve, or other energy isolating device so that the energy source(s) (electrical, mechanical, hydraulic, etc.) is(are) disconnected or isolated from the equipment. Stored energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be dissipated, disconnected, or restrained by methods such as grounding, repositioning, blocking, bleeding-down, etc. Pulling fuses is not a substitute for locking out. A

pulled fuse is no guarantee the circuit is dead, and even if it were dead, there's nothing to stop someone from unknowingly replacing the fuse.

CAUTION: Intermittently operating equipment such as pumps, blowers, fans, and compressors may seem harmless when dormant. Don't assume that because equipment isn't functioning, it will stay that way.

4. **Application of Lockout/Tagout** - Lockout and tag the energy isolating device with an assigned individual lock, even though someone may have locked the control before you. You will not be protected unless you put your own padlock on it. For some equipment it may be necessary to construct attachments to which locks can be applied. An example is a common hasp to cover an operating button. Tags shall be attached to the energy isolating device(s) and to the normal operating control and shall be attached in such a manner as to preclude operation.
5. **Verification of Isolation** - After ensuring that no personnel can be exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.

If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the maintenance or repair is completed, or until the possibility of such accumulation no longer exists.

CAUTION: Return operating controls to neutral position after the test. A check of system activation (e.g. use of voltmeter for electrical circuits) should be performed to assure isolation.

6. The equipment is now locked out.

6.4 Release from Lockout/Tagout

- Before lockout or tagout devices are removed and energy is restored to the machine or equipment, inspect the work area to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.
- Check work area to ensure that all employees are in the clear.
- Notify affected employees that lockout/tagout devices have been removed.
- Each lockout/tagout device shall be removed from each energy isolating device by the employee who applied the device. The energy isolating devices may be opened or closed, i.e., circuit breakers, to restore energy to equipment.

6.5 Lockout/Tagout Interruption (Testing of Energized Equipment)

In situations where the energy isolating device(s) is locked/tagged and there is a need for testing or positioning of the equipment/process, the following sequence shall apply:

- Clear equipment/process of tools and materials.
- Clear personnel.
- Clear the control of locks/tags according to established procedure.
- Proceed with test, etc.
- De-energize all systems and re-lock/re-tag the controls to continue the work.

6.6 Procedure Involving More Than One Person

In the preceding steps, if more than one individual is required to lock out equipment, each shall place a personal lock and tag on the group lockout device when he/she begins work, and shall remove those devices when he/she stops working on the machine or equipment. The supervisor, with the knowledge of the crew, may lock out equipment for the whole crew. In such cases, it shall be the responsibility of the supervisor to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. Additionally, the supervisor shall not remove a crew lock until it has been verified that all individuals are clear.

6.7 Conditions for Padlock Removal

Lockout / tagout devices shall be removed only by the owner of the device except in the following situations:

1. Owner incapacitated by illness, etc.
2. Owner no longer works for the college
3. Owner is on leave and cannot be reached by telephone. If the owner is reached and the situation warrants then he/she will be required to come to work and remove the padlock.

If the Supervisor determines that circumstances warrant the removal of a lockout/tagout device, every effort must be made to contact the owner of the device. After the above conditions have been met the Supervisor may remove the device in the presence of the Safety Officer, or Safety Manager.

6.8 EXCEPTION to Lockout Tagout Procedure

It is not necessary to document the required procedure for a particular machine or equipment, when all of the following elements exist:

- a. the machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees;
- b. the machine or equipment has a single energy source which can be readily identified and isolated;
- c. the isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment;
- d. the machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- e. a single lockout device will achieve a locked-out condition;
- f. the lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance; and
- g. the servicing or maintenance does not create hazards for other employees;

7.0 LOCKOUT / TAGOUT EQUIPMENT

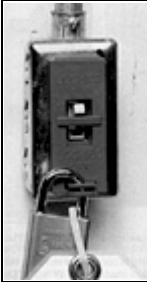
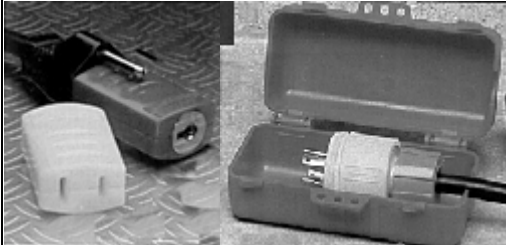
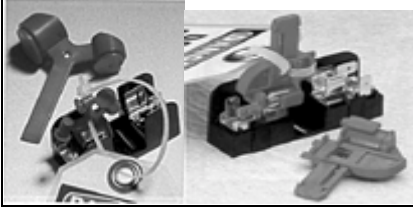
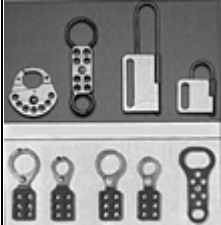
All equipment shall be provided and maintained by the departments, contractors who service and maintain the equipment. Such equipment shall include but not be limited to the following:

- Standardized padlocks issued on an individual basis with the serial number being assigned and logged in the authorized employees name. Padlocks should be colour coded to identify the trade group or related department.
- Padlocks will be assigned to authorized persons with the serial number being logged against that persons name.
- Waterproof lockout tags made from a non-conductive material to be provided to all authorized service persons who will ensure that when placed on locked out machinery or equipment is secured to the lock and states the reason for the lockout, date of the lockout and the name of the person involved. All locks must be placed in a conspicuous location and secured to prevent inadvertent removal. (Refer to figure 1)
- A supply of lockout devices; i.e. chains, blanks, plugs and blocks accessible in areas where such equipment will be required to isolate and achieve zero energy within the machinery and equipment being serviced. (Refer to figure 2)

Figure 1: Lockout/Tagout Tag



Figure 2: Examples of Lockout/Tagout Devices

<p>Lockout of a switch</p>	
<p>Devices for locking out power cords</p>	
<p>Tools for locking out fuses</p>	
<p>Hasps for use with multiple locks</p>	

8.0 RECORDS

All Lock Assignment Records shall be kept and held by supervisors for three years to comply with any audits from the Ministry of Labour (MOL).

All Lockout/Tagout sheets must be properly filled out, one copy is for the supervisor to keep on file for three years, and another copy is to be sent to Safety and Security Services.

9.0 REGULATIONS

Occupational Health and Safety Act – Ont. Reg. Industrial Establishments
Sections 42, 43, 75, 76

LOCKOUT / TAGOUT RECORD SHEET

Lockout/Tagout Program Lock Assignment Record

	Department	Lock #	Name	Phone #	Date Issued	Date Returned
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						



LOCKOUT / TAGOUT RECORD SHEET

Lockout/Tagout number: _____

Component/System/Equipment: _____

Area: _____

Requested by (Print): _____ (Sign) _____

Supervisor (Print): _____ (Sign) _____

Issued For	Accepted (Lockout/Tagout Holder)		Work Authorized (Responsible Supervisor)		Release Lockout/Tagout (Lockout/Tagout Holder)	
Activity Identification	Name	Date Time	Name	Date Time	Name	Date Time

