Subject:	LOCKOUT / TAGOUT PROCEDURE	Number: FMOP 2-1
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LOCKOUT / TAGOUT PROCEDURE

Contents

1.0 Background. The purpose of this procedure is to ensure that employees will not be injured or otherwise harmed by the accidental starting of any machine, device or process that has been made inoperable for the purpose of undertaking maintenance activities. It is also intended that this procedure will assist with ensuring compliance to the lockout requirements as detailed in the Occupational Health and Safety Act Regulations and the Ontario Electrical Safety Code.

This procedure describes methods of ensuring that:

1.0.1. The equipment or process is immobilized and isolated prior to carrying out any maintenance work, and

1.0.2. No person re-energizes the equipment or process before all workers are aware of the start-up and clear of the equipment.

2.0 Compliance with Policy – Brock University Employees. In consideration of the personal safety of others and 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.

3.0 Compliance with Policy – Brock University Contractors. All Contractors working at Brock University, undertaking work subject to the Occupational Health and Safety Act and Regulations regarding Lockout / Tagout work, will:

3.0.1. Provide a copy of their company's Lockout / Tagout procedure prior to commencing work. In cases where Contractors are working with Brock University Staff in Lockout / Tagout work, Brock University's Lockout / Tagout Procedure will be followed by University Staff.

3.0.2. Provide evidence that the Contractor's staff has been trained with respect to their Company's Lockout / Tagout Procedure.

4.0 Responsibilities of Parties. It is the responsibility of <u>each person</u> involved in the Lockout / Tagout procedure to:

4.0.1. Identify all sources of energy used or stored at each machine, device or process in order to ensure that the equipment or process is brought to a Zero Energy State prior to beginning work on the system. Due to the hazard of shock or electrocution while working adjacent to live power, every effort must be made to eliminate all sources of electricity. In the event that a worker must work near a live power source, he must, in advance of the work, contact his Supervisor and the Manager, Electrical Team, for instruction and to ensure that adequate personal protective equipment (PPE) and training in its use is provided prior to the work commencing.

4.0.2. Properly use lockout devices and tags to ensure that the machine, device or process remains at a Zero Energy State while work is underway.

4.0.3. Energy sources include:

- Electrical – including the possibility that some devices have more than one source of electrical energy
- Hydraulic
- Pneumatic
- Thermal
- Stored (springs, capacitors)
- Chemical
- Gravitational
- Inertia
- Mechanical

4.0.4. The following is an overview of responsibilities associated with this Lockout / Tagout procedure.

4.0.4.1. Person In Charge. The "Person in Charge" is defined as the person tasked with making a repair or adjustment to equipment or a process where a "Lockout / Tagout" Procedure is required to complete the work. The person in charge will be the first person to Lockout the equipment or process and the last one to remove Lockout Devices and tags. The Person in Charge will:

i) Be aware when the Lockout / Tagout Procedure is needed and how to apply the Lockout / Tagout Procedure.

ii) Identify all of the energy hazards in preparation for the shutdown. If in doubt, ask your supervisor.

iii) Shut down and isolate all energy sources with the appropriate energy-isolating device, confirming that a Zero Energy State has been attained.

iv) De-energize the machine, device or process and attach the appropriate personal lockout device/tag.

v) Test operating controls/switches to ensure that it has been de-energized.

vi) Prior to removing the lockout device and tag and restoring energy, ensure that the appropriate steps have been followed to protect other workers.

4.0.4.2 Other Workers Assisting the Person In Charge. Other Workers who will work on equipment or a process where a Lockout / Tagout Procedure is required to complete the work will:

i) Be aware when the Lockout / Tagout Procedure is needed and how to apply the Lockout / Tagout Procedure.

ii) Independently confirm that a Zero Energy State has been obtained after the Person in Charge has installed lockout devices and tags.

iii) Install his personal lock and tag prior to working on the equipment or process.

iv) Prior to removing the lockout device and tag and restoring energy, ensure the appropriate steps have been followed to protect other workers.

4.0.4.3 Supervisor. The Supervisor will:

i) Ensure that the lockout / tagout procedure is understood and followed by all employees as required.

ii) Co-ordinate work that extends beyond one shift with other supervisors/workers as appropriate.

iii) The supervisor, in consultation with the Manager, Electrical Team, will advise any worker who must work near live power of the hazards in doing so and also provide Personal Protective Equipment and training in its use, prior to the commencement of work. Working near live power is to be avoided if possible.

4.0.4.4 Employee Health & Safety.

i) Train all staff in the Lockout / Tagout procedure and maintain records of the training.

ii) Review the procedures and make recommendation as needed to ensure continuous improvement.

5.0 Lockout / Tagout Procedure. Every employee must follow this procedure where the inadvertent or accidental starting, or energizing, of a machine, device or process may endanger a worker. This may include but is not limited to situations where equipment or a process is cleaned, repaired, altered, set-up or adjusted.

5.0.1. Each worker subject to the Lockout / Tagout Procedure will be given his/her own individually keyed personal locks by his supervisor. These locks and tags are the worker's personal safety equipment and are not to be loaned. There will be no duplicate or master keys. **Mechanical Team** locks are numbered and coloured ***blue***, **Electrical Team** are numbered and coloured ***red*** and **Structural Team** are coloured ***green***.

5.0.2. The Person in Charge, after ensuring that the machine, device or process has been completely shut down in the normal manner, will isolate all energy sources using the appropriate energy-isolating device(s), which may include disconnect switches, blanks, line valves, etc.

Caution: Prior to operating a disconnect switch, ensure that the Hand/Off/Auto switch is in the Off position. In addition, the disconnect

switch should be operated with the left hand with the body to the right side of the switch and the head turned away from the switch. This is to minimize risk of injury should the switch explode due to arcing.

5.0.3. The Person in Charge will ensure that an electrician is present where power is required to test or troubleshoot electrical systems or, the source of electrical power is required to be determined prior to isolation. If fuses are to be removed, an electrician must use fuse pullers due to the proximity of the bus bar, which is still energized. The removal of fuses only does not constitute a lockout. If work is to be performed on electrical circuits or equipment, an electrician shall first test for electrical potential with a proven meter.

5.0.4. The Person in Charge will de-energize the machine or system and check that there is no stored or residual energy that could create a hazard once the lockout device(s) have been attached. Examples of checking for stored or residual energy are reading pressure or temperature gauges, attempting to start the machine or device using the normal operating controls or computer commands where applicable to make sure that it has been de-energized, checking that the main disconnect switch cannot be moved to the “on” (closed) position, ensuring that all of the operating controls and switches are returned to the “off” position before starting the work activity.

5.0.5. After ensuring that the equipment or process is in a Zero State of Energy and all sources of energy are isolated, the Person in Charge will install energy-isolating devices, tags and his personal lock(s) to lock each of the energy-isolating devices. The key for each personal lock will be retained by the Person in Charge. The lockout device of the Person in Charge must be installed first, remain throughout the work activity and be removed last. If more than one lock is required, a multi-hasp can be used.

5.0.6. The Person in Charge will complete a lockout tag and affix it to each energy-isolating device. The tag shall state:

5.0.6.1 Reason why switch is disconnected.

5.0.6.2 Name of worker who disconnected and locked.

5.0.6.3 Date when switch was disconnected and locked.

5.0.7. Each person working on the machine, device or equipment must also:

5.0.7.1 Ensure that the equipment or process is in a Zero State of Energy and all sources of energy are isolated.

5.0.7.2 Use his personal lock to lock each of the energy-isolating devices and personally retain the key.

5.0.7.3 Complete a lockout tag(s) and affix it to his personal lock(s).

5.0.8. When the work is completed and prior to removing personal locks and tags, each worker shall ensure that:

5.0.8.1 The operational controls are in the “off” position so that the main disconnect switching is not done under load.

5.0.8.2 All materials or devices used to de-energize and tools or materials used for the work are removed.

5.0.8.3 The machine or device is operational and all safety-related devices (i.e., guards) are re-installed.

5.0.8.4 All personnel are clear of the area and notified that lockout device(s) will be removed and energy restored.

5.0.9. A personal lock and tag may not be removed by anyone other than the worker who placed it on the equipment or process. Should a worker go home without removing his lock, he may be called at home to return to the University to remove his lock, without compensation.

5.0.10 If equipment is to be locked-out overnight, the Person in Charge will install a system lock (coloured gold) and a completed tag attached to the system lock stating:

5.0.10.1 Reason why device is disconnected.

5.0.10.2 Name of worker who disconnected and locked.

5.0.10.3 Date when switch was disconnected and locked.

5.0.11 The system lock will be installed prior to the removal of all personal locks. Its purpose is to protect the equipment or process by preventing unauthorized start-up of the system by others. It is not intended to provide personal safety protection.

5.0.12 **System locks** (***gold***), tags and lockout devices 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
- CUB (electrical shop)
- Academic South Mechanical Room 300 level
- System locks for high voltage only are located in the Electrical Shop and are coloured orange.

5.0.13 When a worker is required to work on equipment or a process that has been protected by a system lock, the worker(s) will repeat the entire Lockout /Tagout Procedure prior to applying personal locks and removing a system lock. System locks do not provide personal safety protection.

5.0.14 Any worker who is unsure as to lock-out procedure should seek direction from his supervisor before proceeding.

6.0 References: The following documents were referenced in the preparation of this Procedure:

6.0.1. Brock University Physical Plant Policy #3 – "Lock-Out & Tag-Out" dated October 2002.

6.0.2. IAPA – "Sample Lockout / Tagout Procedure.

6.0.3. Electrical Safety Authority – "Lock-Out & Tag-Out, 2000.

6.0.4. *Occupational Health & Safety Act.*

6.0.5. Industrial Establishments – Regulation 851.

6.0.6. Construction Projects – Ontario Regulation 213/91.

Annexes

Annex A Lockout / Tagout Form