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Service des immeubles
Physical Resources Service

STANDARD OPERATING PROCEDURE FOR LOCK OUT AND TAG OUT

UNIVERSITY OF OTTAWA
PHYSICAL RESOURCES SERVICE

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1. Objective

This general procedure aims to set a minimum safety standard for lockout, which is intended to reduce the risk of severe injury by ensuring that equipment cannot be accidentally turned on, switched on, or pressurized while a worker is servicing it. Additional procedures may need to be developed for other applications that require additional safety measures, such as for residual energies.

2. Applicable legislation, guides, and policies

1. Occupational Health and Safety Act of Ontario
2. Ontario Regulation 851, Industrial Establishments
3. Ontario Regulation 213/91, Construction Projects
4. Ontario regulation 632/05, Confined Spaces
5. Electrical Safety Authority: Ontario Electrical Safety Code, 25th Edition, 2012.
6. ANSI/ASSE Z244.1-2003 (R2008), Control of Hazardous Energy, Lockout and Alternative Methods
7. CSA Standard, CSA Z460-05 (R2010), Control of Hazardous Energy –Lockout and Other Methods
8. University of Ottawa Policy 40, Maintenance and Repair of Equipment

3. Definitions

Regarding the lockout procedure, the following definitions apply:

1. **Competent person** – A person who is qualified because of knowledge, experience and training to organise the work and its performance; who is familiar with the Ontario Occupational Health and Safety Act and the regulations that apply to the work; and who has knowledge of any potential or actual dangers to health and safety in the workplace
2. **Danger tag**
    1. A label bearing information on the use of locks, i.e. the reason for the lockout, a reference to a specific lockout manual if using a departmental lock, the name of the person who applied the lockout and the date that the lockout was applied and may contain the name of the equipment in lockout. The words “Danger, ne pas alimenter” and “Danger Do Not Start” are written on the label.
    2. The label and tie are made of non-conducting material.
    3. In addition, the label is duplicated as many times as necessary for a multiple lockout.
    4. One label and the key are kept in the departmental lock cabinet; the other label is affixed to the lock and placed on the piece of equipment (Appendix D).
3. **Departmental locks** – A lock bearing the department name and an order number (Appendix A). The departmental lock replaces a personal lock when the worker must leave the worksite at the end of the shift; it is also used to lockout a piece of equipment for one or more days. In all cases, the reason for using this lock must be indicated on a label provided for this purpose. Use of a departmental lock alone is not an adequate safety measure while work is being carried out: the personal lock must also be used.

Departmental locks and keys are available in every department. Workers should contact their immediate supervisor if the departmental locks cannot be found.

NOTE: A lockout is not intended to replace removal of equipment that needs to be taken out of service.

4. **Equipment**
    1. A piece of equipment or machine that has a power source or can generate its own power.
    2. Such equipment may include, but is not limited to, a shaft, a boiler, a pressure vessel, compressed air or steam machine, a conduit or a pipeline.
5. **Identification label** – A label attached to the personal lock on which the worker's name is engraved (Appendix A).
6. **Lockout box:** A box containing the key(s) of the departmental locks as well as the lockout card(s). This box is used for a multiple lockout. Each worker involved adds his personal lock and keeps the key(s) (Appendix B).
7. **Lockout chain or valve lockout device** – A chain or device to which the lock is attached to lock out the valve (Appendix E).
8. **Lockout form –** A form indicating the procedure to be followed to lock out equipment. Each time it is used and equipment is locked out, the person responsible for the lockout signs the card and indicates the date of the lockout. (Appendix C).
9. **Lockout Manual** – A binder that is available in every lockout station. It contains a logbook that records the use of departmental locks as well as the lockout procedure.
10. **Supervisor, Lead Hand or Shift Engineer** – "A person who has charge over a workplace or has authority over a worker performing a lockout." The person responsible for the worker performing the lockout.
11. **Person responsible for the lockout** – A worker and a person of competence who is responsible for performing the lockout.
12. **Worker** – A person who performs work for monetary compensation. A worker can be an employee of the University of Ottawa or an outside contractor. A worker must ensure his or her own protection.
13. **Personal lock**
    1. A lock bearing the worker's name (Appendix A).
    2. In a single lockout, personal locks are used directly on the equipment with a safety clasp.
    3. In a multiple lockout, personal locks are placed on the lockout box.
    4. The personal lock must protect a single worker. Only this worker has the key to his/her lock.
14. **Operator** – A competent worker who is directly responsible for operating a specific piece of equipment.
15. **Power source** – Energy or power generated by any one of the following: compressed air, vapour, electricity, hydraulic energy or any equipment or machine that can generate power.

16. **Residual energy** – Energy that is stored in a system and must be eliminated (i.e., purged, bled, drained, etc.) before work can begin. Forms of energy can include thermal energy, compressed air, electrical energy, hydraulics, etc.
17. **Safety clasp** – A device that allows for the addition of locks for all workers (Appendix E).
18. **Switch –** A device that serves to break, supply or divert the electrical current in a piece of equipment.
19. **Work** –the tasks that need to be performed while the equipment is locked out, which can include inspections, repairs, adjustments, maintenance or cleaning, including emergency work.

4. Responsibilities

1. **Management**
    1. Ensures that the lockout procedure is consistently applied and periodically revised.
    2. Communicates the information about the lockout procedure.
    3. Ensures that the lockout equipment and applicable components are available at all times.
    4. Ensures that new workers are trained in lockout procedures within the first six months of employment and provide refresher training internally at least every five years.
2. **Project managers**
    1. Determine what equipment and other devices require lockout during construction or renovation projects.
    2. Ensure that all contractors, including sub-contractors, follow the University of Ottawa lockout procedures.
    3. If requested, supply lockout information to those concerned.
3. **Supervisor, Lead Hand or Shift Engineers**
    1. Are responsible for all lockout activities in the department.
    2. Ensure the safety of all workers involved in locking out equipment. Ensure that those responsible for the lockout work have the skills required to carry out their duties.
    3. Ensure that the workers know and apply the procedure.
    4. Ensure that all workers involved have placed their locks.
4. **Person responsible for the lockout**
    1. Determines the components to be locked out and the procedure for doing so, in cooperation with the service or department concerned.
    2. Ensures that the lockout procedure is applied
    3. Ensures that the work can be safely carried out. To this end, the person in charge of the lockout ensures that the lockout is complete before the work begins.

4. If the work is not completed by the end of the shift, the person responsible for the lockout removes their personal locks so that the departmental locks can be installed. The person in charge of the lockout fills out the instruction labels for the departmental locks and includes all necessary information.

5. **Worker**
   1. Must ensure his/her personal safety and the safety of others at all times while working.
   2. Follows the proper lockout procedure for each individual piece of equipment.
   3. Ensures that the lockout forms, as well as the key to the departmental locks, are in the lockout box or on the lockout board.
   4. Installs locks according to the lockout procedure.
   5. Removes locks when the work is complete.
   6. If the work is not completed, the worker must inform the person responsible for the lockout that personal locks will be removed and replaced with the departmental locks at the end of the shift.
   7. At all times, the worker is responsible for the keys for the locks he or she has used.

6. **Contractor** – When a contractor is involved in a job, he assumes responsibility for the lockout. As such, he reports to the Project Manager or to the department. The contractor must follow the University of Ottawa lockout procedure

5. Work procedure

Table 1. Energy forms, energy sources and general lockout guidelines.

Type of Energy	Energy Source	General Lockout Guidelines
Electrical energy	• Power transmission lines • Machine power cords • Motors • Solenoids • Capacitors (stored electrical energy)	• First, turn power off at machine (i.e., at point of operation switch), and then turn power off 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.

Hydraulic Energy	• Hydraulic systems (e.g. hydraulic presses, hammers, rams, cylinders)	• Shut off, lock (with chains, built-in lockout devices, or lockout attachments) and tag valves. • Bleed off and blank lines as necessary.
Pneumatic Energy	• 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 (energy of a moving object or matter) Object may be powered or coasting)	• Blades • Flywheels • Material in supply lines of bins or silos	• Stop and block machine parts (e.g., stop flywheels and ensure that they do not cycle) • 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 (energy stored in an object with the potential for release due to its position)	• Springs (e.g. in air brake cylinders) • Actuators • Counterweights • Raised loads • Top or movable part of a press or lifting device	• If possible, lower all suspended parts and loads to the lowest (rest) position. • Block parts that might be moved by gravity. • Release or block spring energy.
Thermal energy	• Supply lines • Storage tanks • 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 "Lockout: A Health and Safety Guideline for Your Workplace," Industrial Accident Prevention Association, 2008.

Note that lockout is not required while performing diagnostic testing.

1. **Step-by-step procedure for single lockout**
    1. This procedure applies when only one lockout is performed, not for multiple lockouts.
    2. If the worker feels that he/she needs help, another tradesperson will be called upon to help carry out the lockout procedure.
    3. The worker checks the number and the description of the equipment and then installs his/ her personal lock and the corresponding instruction label.
    4. Before beginning work, the worker must safely release all stored and residual energy in any electrical, pneumatic, mechanical or hydraulic systems by relieving, blocking, bleeding, restraining, grounding or making safe the system. See the General Lockout Guideline (page 5) for more information.
    5. The worker returns to the machine or equipment and tries to start it to make sure that the power source has indeed been disconnected, and that all energy has been released. If power or residual energy is present, the lockout must be reassessed.
    6. The worker carries out the necessary maintenance or repairs.
    7. When the work is complete, the worker must ensure that the site is clean and safe, that no one else is on the site, that the equipment or machine is safe and that barriers and/or guards have been put in place.
    8. The worker starts the machine or asks the operator to start the machine, as the case may be.
2. **Procedure for multiple lockout:**
    1. The person responsible for the lockout obtains the lockout forms from the department.
    2. If the lockout form needs to be changed before the work is carried out, the person responsible for the lockout makes the necessary changes and signs the form.
    3. The person responsible for the lockout follows the instructions on the lockout form, using the lockout box and the departmental locks.
    4. Once the lockout is completed, the person responsible for the lockout places a danger tag on the equipment or power source that has been locked out.
    5. This person also signs and dates the lockout form, thereby authorizing workers to carry out the work, places the keys from all the departmental locks in the lockout box and attaches a departmental lock and a danger tag to the equipment.
    6. The lockout box is placed in the predetermined lockout area.
    7. Each worker directly involved in the work reads the lockout form and if the worker is satisfied that he/she can safely work, the worker attaches his/her personal lock to the lockout box. If the worker has any reasonable doubts, he/she must personally check the locked out (sealed) equipment before placing his/her lock on the lockout box.
    8. The person responsible for the lockout is the last person to remove his/her lock or the departmental lock, after checking that the workers have completed the work and have removed their individual locks.

9. Any person having the necessary knowledge and experience may be assigned responsibility for removing the locks and tasked to do so.
10. When all the locks have been removed, the lockout form is returned to the department representative, indicating that the work is complete.

3. **Valve lockout procedure** – To lock out pressurized systems
    1. The worker takes down the valve number.
    2. The worker asks the operator in charge to close the manual valve.
    3. The worker checks the valve number, places his/her personal lock on the valve (a chain or a valve cover is available for this purpose), and then attaches a danger tag.
    4. All workers must refer to the confined space procedures before entering a confined space to perform maintenance or repairs.
    5. The worker opens the automatic and/or depressurization valve, if any, to check whether the line is depressurized.
    6. Before carrying out the work, the worker checks that the pipe, pipeline or the piece of equipment is empty and clean.
    7. After completing the work, the worker removes his/her personal lock.
    8. The worker advises the operator in charge that the work is complete.

6. Forgetting to remove a personnal lock

1. A worker who forgets to remove his/her personal lock may be called back, without pay, to remove the lock. If the worker cannot be reached, the person responsible for the lockout may give the order to cut the lock, after checking that there is no danger to any workers or machinery.

7. Disciplinary measures

1. Disciplinary measures may be taken against any person who does not respect this lockout procedure, in accordance with Policy 2D and the collective agreements in force at the University.

Appendix A

Personal lock with brass identification label

Appendix B

Lockout box

Appendix C

Lockout form

Lockout Card N^{o}_____
Page _____ / _____
Revised on _____
Equipment N^{o} : _____
_____
_____
_____
Equipment N^{o} : _____
Equipment description : _____
_____
Approval : _____

Service _____
Work-order N^{o} : _____
Equipment N^{o} : _____
Equipment Description: _____
_____
Partial use of form:

Circle necessary steps:

PROCEDURE				Supervisor				
				Close	Open	Locked out	Blanked	End of work / Unlocking / Check if done
Step	**Description**	**Element #**	**Location**					
01	_____	_____	_____	☐	☐	☐	☐	_____
02	_____	_____	_____	☐	☐	☐	☐	_____
03	_____	_____	_____	☐	☐	☐	☐	_____
04	_____	_____	_____	☐	☐	☐	☐	_____
05	_____	_____	_____	☐	☐	☐	☐	_____
06	_____	_____	_____	☐	☐	☐	☐	_____
07	_____	_____	_____	☐	☐	☐	☐	_____
08	_____	_____	_____	☐	☐	☐	☐	_____
09	_____	_____	_____	☐	☐	☐	☐	_____
10	_____	_____	_____	☐	☐	☐	☐	_____
				☐	☐	☐	☐	

REMARKS

Put lockout card in lockout box
(Give lockout card to appropriate department when work is completed)

CERTIFICATION:

Lockout card completed by: _____ Date _____
Verified by: _____ Date _____
Approved by: _____ Date _____
Supervisor

AUTHORIZATION FOR WORK TO PROCEED

Lockout complete _____
Authorization granted _____
Number of workers involved _____

Lockout procedure is currently being undertaken by:

Responsible for:

Contractor:

Service_____ Section_____
Name _____ # Pager_____
(Print)

Maintenance:

Name _____ # Pager_____
(Print)

Fiche de cadenassage

Fiche de cadenassage n^{o}_____
Page _____ / _____
Révisé le _____
Numéro de l'équipment : _____
_____

Service _____
Demande de travail n^{o} :_____
Nom de l'équipment : _____

Description de l'équipment : _______ _____

_____ _____

Utilisation partielle de la fiche

Encercler les étapes nécessaires

Numéro de l'équipment : _____

Description de l'équipment : _____

_____

Approbation du secteur : _____

PROCEDURE

Superviseur

Étape	**Description**	**# Élément**	**Localisation**	Fermer	Ouvrir	Cadenasser	Obturer	Fin des travaux Décadenas-sage Cochez si ef-fectué
01	_____	_____	_____	☐	☐	☐	☐	_____
02	_____	_____	_____	☐	☐	☐	☐	_____
03	_____	_____	_____	☐	☐	☐	☐	_____
04	_____	_____	_____	☐	☐	☐	☐	_____
05	_____	_____	_____	☐	☐	☐	☐	_____
06	_____	_____	_____	☐	☐	☐	☐	_____
07	_____	_____	_____	☐	☐	☐	☐	_____
08	_____	_____	_____	☐	☐	☐	☐	_____
09	_____	_____	_____	☐	☐	☐	☐	_____
10	_____	_____	_____	☐	☐	☐	☐	_____
				☐	☐	☐	☐	

REMARQUES Mettre fiche et clef dans la boîte de cadenassage
(Remettre la fiche au secteur concerné lorsque les travaux sont complétés)

VALIDATION:

Cette fiche a été dressée par: _____ Date _____

Vérifiée par: _____ Date _____

Approuvée par: _____ Date _____

Superviseur

UTILISATION ET AUTORISATION DE TRAVAIL

Cadenassage complété _____

Authorisation accordée _____

Nombre de travailleurs impliqués _____

La procedure de cadenassage
est présentement appliquée par:

Responsables du: Entrepreneur:

Service_____ Section_____

Nom _____ # Pagette_____
(En caractère d'imprimerie)

Entretien:

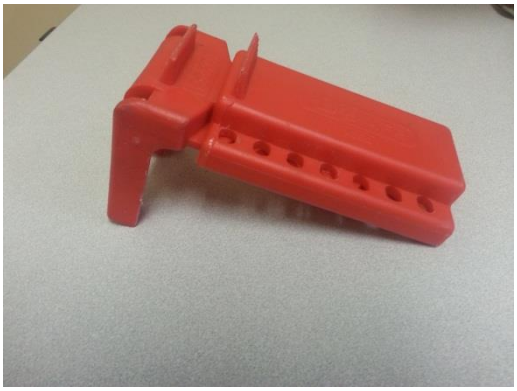
Nom _____ # Pagette_____
(En caractère d'imprimerie)

Appendix D

Danger tag

Appendix E

Assorted lockout devices



Appendix F

LOCKOUT DEVICE AND INFORMATION TAG REMOVAL REPORT

Department: _____

Shift: _____

Authorized Employee's Name: _____

Supervisor's Name: _____

Machine, Equipment or Process: _____

Date and Time Lockout Device and Information Tag were discovered to be left on:
_____
_____

Reason(s) for Removal of Lock and Tag:
_____
_____

Confirmation that the Authorized Employee has left site or facility:
Supervisor's Signature: _____ Time and Date: _____

Attempts to contact the Authorized Employee:
Supervisor's Signature: _____ Time and Date: _____

Authorized Employee has been contacted and is returning to workplace to remove the lockout device(s) and information tags. (Procedure ends, exit procedure, file form for future reference.)
Supervisor's Signature: _____ Time and Date: _____

Authorized Employee cannot be reached or is unable to return to the site to remove their lock or Information Tag.
Supervisor's Signature: _____ Time and Date: _____

The status and condition of the machine or equipment has been assessed and is confirmed to be in a state that will allow for the safe removal of the lockout device.
Supervisor's Signature: _____ Time and Date: _____

Steps have been taken to prevent the Authorized Employee from resuming work at this site without notification that their lock and tag have been removed.
Supervisor's Signature: _____ Time and Date: _____

Witness (print): _____ Witness signature: _____
Time and Date: _____

Appendix G

WARNING

Notice to Employee

Name of worker:
_____

Department: _____

The lockout device and information tag that you applied to (machinery or equipment):

_____

_____

located in (room/building):_____ has been

removed by (supervisor's name and extension number):_____

ext. _____

The reason for the removal was: _____

Please report to your immediate supervisor before starting work.

Date: _____

Supervisor: _____