Corporate Policy and Procedure

POLICY	**Lockout Program**
CATEGORY	Health & Safety
AUTHORITY	All Departments
RELATED POLICIES	PPE Policy Job Hazard Analysis Contractor Safety Management Program Energized Electrical Work
APPROVED BY	Executive Team
EFFECTIVE DATE	February 7, 2007
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Policy Statement

Guided by our corporate value of wellness, the City of Guelph shall ensure a lockout program is in place which will prevent the possibility of unexpected machine or equipment start-up and the unexpected release of stored energy that could cause injury.

Through this program, departments will implement procedure(s) to isolate equipment energy source(s) through the use of lockout devices during service and maintenance activities.

Purpose

To ensure that all energy sources are isolated and effectively controlled or de-energized prior to any work being done on or in close proximity to machinery or equipment.

Scope

All departments and contractors working with energy sources that include but are not limited to: kinetic, chemical, potential, thermal, electrical, and radiation.

Definitions

Affected Worker

Any worker who works in the area of a machine being serviced, but who is not servicing or providing maintenance to the equipment. It is the Affected Worker's responsibility to be aware of the work being performed on the equipment, and the

status of that work, to remain in a safe location and not be directly involved with that work or attempt to operate the equipment.

Assigned Lock
A lock for which the worker personally controls the key.

Auditor
An authorized worker who has been assigned to conduct periodic inspections of the lockout procedure.

Authorized Worker
A person who is qualified to engage in hazardous energy control because of knowledge, training, and experience and has been assigned to engage in such control.

Clear
The process of ensuring that no one is near the system before it is checked to ensure that all power is out.

Chemical Energy
The energy that can be released by chemical reaction. Hazardous chemical energy can be released with flammable, combustible, and corrosive substances.

Departmental Locks
A group of numbered locks maintained by the Manager/Supervisor for use where no personal lock is available to an authorized worker or to ensure continued lockout where an authorized worker needs to remove their personal lock, but the equipment or system is not yet ready to be released. (Also known as a Shop Lock)

De-Energized
Disconnected from all energy sources and not containing residual or stored energy.

Electrical Energy
Conductors, motors, and generators are sources of electrical energy. Both low voltage and high voltage equipment and conductors can injure or kill workers. Maintenance work on lighting systems or electrical panels, for example, requires lockout.

Energized
Connected to an energy supply or containing residual or stored energy.

Energy Isolating Device
A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors; a line valve; a block; and other devices used to block or isolate energy (push-button selector switches and other control-type devices are not energy-isolating devices). Stop buttons on control circuits and programmable logic controllers (PLCs) **must not** be used as energy-isolating devices.

Energy Source
Any form of energy that can operate equipment, cause movement or result in injury directly from the energy source. Includes but is not limited to electrical, mechanical, radiation, process liquids, steam, air, water, oil, hydraulic, and vapour sources.

Hasp
A sturdy fastener with a hinged slotted part that fits over a staple and is secured by a pin, bolt, or padlock. A hasp allows multiple padlocks to be applied to a lockout point thereby allowing an energy source to be isolated by more than one worker.

Hazardous Energy
Any actual or potential electrical, mechanical, hydraulic, pneumatic, chemical, kinetic, thermal, gravitational, or other energy that can harm personnel.

Hazardous Zone
Area within a worker's work environment where injuries could occur as a result of physical contact with machine elements, materials or other agents.

Kinetic Energy
The energy of moving equipment or moving materials.

Lockout
Placement of a lock on an energy-isolating device in accordance with this procedure. The energy-isolating device shall be incapable of being operated until the worker removes the lock. Lockouts gradually involve: i) stopping all energy flows, e.g. turning off switches, or valves on supply lines; ii) locking switches and valves, iii) securing the machine, device, or power transmission line in a de-energized state, e.g., by applying blocks or blanks, or bleeding hydraulic or pneumatic pressure from lines.

Lockout Device
A mechanical means of locking that uses an individually keyed lock to secure an energy isolating device in a position that prevents energization of a machine, equipment or process. Otherwise known as a lock. Locks must (i) be strong enough to withstand the environment in which they will be used, (ii) not able to be inadvertently or accidentally removed without the use of excessive force, (iii) only be removed by the person conducting the lockout required work.

Lockout Postings
Specific instructions used to supplement the Corporate Lockout Program for all machines and processes with multiple energy sources.

Potential Energy
Stored energy that an object has the potential to release due to its position

Primary Authorized Individual

An authorized worker who has been assigned to perform or assume control over a group lockout and has the authority over other authorized workers entering into a danger zone around a hazardous machine or energy system.

Radiation
Radiation energy includes non-ionizing and ionizing radiation.
Release
Process of releasing the equipment for the work to be done on it. This means that all is safe to release the system to work on.

Residual Power
Energy which is retained in a system, machine or unit when the power supply line disconnect is placed in the "off" position. Power capacitors and electric or magnetic fields are examples that may have residual power if not properly dissipated.

Tag
The use of a Danger Tag to warn people that the equipment or process was locked out of service. It indicates the reason and the name of the person in charge.

Thermal Energy
Energy in heat, which is found in steam, hot water, fire, gases, and liquefied gases.

Roles & Responsibilities

Executive Team

- Ensure that service area leaders are aware of the content of this policy, and support the successful implementation of the requirements as laid down.

Supervisor/Manager

- Ensure that all potential hazards are evaluated, the necessary precautions taken, and that personnel are properly trained and work in accordance with this policy.
- Implement written procedures for machinery, equipment, or processes based on City of Guelph policies and processes, legislative requirements, manufacturers' instructions and/or industry best practices.
- Administer the procedures and verify they are in use.
- Ensure that all potentially affected workers are trained in lockout procedures.
- Ensure that, an audit of a lockout by each Authorized Worker is conducted at least annually.

Authorized Worker

- Adhere to all the requirements of this program.
- Lock out the energy-isolating device or place a personal lock on the key-securing system in a group lockout procedure.
- Remove personal locks upon completion of work.
- Keep control of the keys to personal locks throughout the duration of work.
- Not remove any other workers lock other than their personal locks.

Affected Worker

- Adhere to all the requirements of this program
- Be aware of the work being performed by the Authorized Worker, and the status of that work.
- Remain in a safe location and do not become directly involved with that work or attempt to operate the equipment.

Procedure

Lockout is required when:

a. A guard or safety device is removed or bypassed;
b. Any part of the body is in a position where it could be caught or trapped by moving machinery or equipment or;
c. Performing service and/or maintenance on a machine or equipment where unexpected start-up or release of stored energy could cause an injury.

Lockout Posting

- All departments must have lockout posting(s) to supplement this procedure.
- Refer to Appendix A for example of lockout posting.
- For machine, equipment, and processes with multiple energy sources, the Department Manager or Supervisor shall ensure a lockout posting is developed. Such postings will be machine specific and will be used on machines and equipment to identify and locate multiple energy sources.
- Lockout postings, at minimum, must include the following information:
    - All sources of energy
    - Location of each energy source
    - Identification of energy isolating means
    - Specifies the checks to verify isolation
    - Sequence for "total energy isolation":
- Machines that have a single energy source which can be readily identified and isolated, and have no remaining sources of residual energy after the single source, can be locked out by a single device and do not require a posting. Such machines should however have the energy source identified by a label "Lockout Here" attached at the point of lock out.

Isolation Procedure for all Energy Sources

Isolation of energy sources takes place before starting work on any machinery, equipment or process. It involves a five-step process: **Lock, Tag, Clear, Try, and Release**

1. **Lock**
    - The Authorized Worker will notify the affected personnel of the extent and duration of the shutdown of the machinery, equipment, or process.
    - The Authorized Worker will ensure that all machinery, equipment or process are shut down, locked and tagged.
    - Each individual working on or near the equipment must place their assigned lock and tag at the lockout point(s).
2. **Tag**

- A tag must be securely attached to each lock, placed in a conspicuous location.
- The tag must be made of non-conductive material, state the reason for the lockout, the name of the Authorized Worker and the date of the lockout.

3. **Clear**
   - The Authorized Worker will clear the machinery, equipment or process of any hazards or people.
4. **Try**
   - Once all energy sources are locked out and tagged, and all is clear, the Authorized Worker will try to activate the equipment:
     - Operate equipment controls to ensure machine, equipment or process will not activate, and
     - Ensure the machine/ equipment/ process controls are returned to the off or neutral position immediately after the test, and
     - Relieve or restrain any residual or stored energy, and
     - Ground electrical energy stored in capacitors, and
     - Test with appropriate test equipment and visually check to determine energy sources have been neutralized.
5. **Release**
   - If assessment confirms everything is properly locked out, the Authorized Worker will release the equipment for work to be done.

Multiple Person or Group Lockout

- In cases where more than one authorized individual is being protected by multiple energy-isolating devices, a Primary Authorized Individual may be assigned overall responsibility for the lockout of each energy-isolating device.
- Each individual key for a lockout device may be controlled by a lockable device (lock box, key ring etc.) that remains under the control of the Primary Authorized Individual (if any).
- Each person working on a machine, equipment, or process is responsible for locking out the energy-isolating device. Multiple locks can be applied with a hasp.
- The Primary Authorized Individual or the first Authorized Worker who applies the lock, must make sure the lockout is effective and the equipment will not start. When each Authorized Worker has finished maintenance, that worker removes only his or her own personal lock. The Authorized Worker who removes the last lock, or the Primary Authorized Individual, should check that all workers are in the clear and that the equipment can be safely restarted.

Multiple Point Lockout

- To effectively lockout the equipment with multiple energy sources, lockout with several energy-isolating devices.
- Any equipment, machinery, or process specific lockout posting will be required in order to identify all the lockout points (see Appendix A).

Isolation of Energy Sources

- Refer to Appendix B for General Lockout Guidelines for different energy sources.

Completion of Maintenance/Repairs

- The lock and tag must remain on any equipment or system that was rendered inoperable until such time that:
    - The repair of the system has been completed and it is safe to operate or
    - The Authorized Worker turns over responsibility for the system to another person, and the lock and tag of the individual accepting the responsibility is properly affixed to the equipment. Workers coming on shift must place their personal locks on all the lockout points before the workers going off shift remove their locks. Alternatively, the Supervisor may lock the lock-out points using a departmental lock before workers going off shift remove their locks to ensure continuity of the lock-out until workers coming on shift can apply their personal locks.
- Upon completion of the maintenance/repairs, the Authorized Worker will make a final inspection to ensure that all repairs are completed and all guards have been replaced.
- All affected workers are informed prior to the equipment being re-energized. The locks are removed in reverse sequence (the last person to put on the lock will be the first to remove it and the first person to put on the lock will be the last to remove it) and the equipment brought on-line by the Authorized Worker or Primary Authorized Individual.

Special Circumstances

Troubleshooting

- During servicing or maintenance, power may be turned on only when it is required to perform testing or adjustments and no worker is exposed to a hazard. All of the rules pertaining to lock removal and restoring power shall be followed. Following the test/ adjustments, the equipment shall again be locked out as per lockout procedure if it is necessary to continue work on the equipment.
- When conducting troubleshooting activities where energy sources must remain on to perform the task, extreme care shall be exercised to avoid placing anyone in a hazardous zone. Blocking, pinning, and physical disconnecting may be required to secure the machine components in order to complete troubleshooting safely. The required personal protective equipment shall be used for all energized electrical work as required by the Corporate Energized Electrical Work Policy.
- In all cases, energy sources not required for the troubleshooting activities shall have the energy source neutralized and properly locked and tagged out.

Shift Changes

- For workers who have been issued personal locks:
  - If the worker must leave the job before its completion, such as a shift change or job reassignment, the worker shall contact the Supervisor.
  - The Supervisor shall then place a departmental lock on each energy source disconnect prior to the removal of the last worker lock. The Supervisor will retain the key(s).
  - A sign-out/in book for the departmental lock and key must be kept. The key for the Authorized Worker's personal lock must remain only with the worker who applied the lock. **Personal lock keys must not be shared with another person under any circumstances.**
  - Only the Supervisor who placed the departmental lock(s) on the equipment may remove the lock(s). The departmental lock(s) may be removed at any time after the oncoming worker's lock(s) has been applied.
  - In situations where there is need to use a departmental lock, the lock is to remain on the equipment until the next authorized worker affixes their personal lock.
  - Incoming workers shall then apply their own lock(s) during the review of the lockout locations and verify the equipment is de-energized before starting work.

- For workers who are using borrowed departmental locks:
  - If the worker must leave the job before its completion, such as a shift change or job reassignment, the worker shall contact his/ her Supervisor.
  - The Supervisor shall retain the key(s) for the lock(s) involved.
  - Incoming workers shall then apply their own lock(s) during their review of the lockout locations and verify the equipment is de-energized before starting work.
  - The incoming worker will review the lockout locations and verify the equipment is de-energized before starting work.
  - No worker will work solely under a departmental lock(s) unless he/she has control of the key(s). The lockout tag identifying the worker will be changed accordingly.

Abandoned Lock Removal

- When the Authorized Worker who applied the lockout device is not available to remove it, upon completion of the Appendix C - Abandoned Lock Removal Form, the device may be removed using bolt cutters under the supervision of the Authorized Worker's Manager/Supervisor.
- Prior to forcibly removing a lockout device, the Manager/Supervisor must;
  a. Verify the authorized worker is not at the facility;
  b. Make reasonable attempts to contact the Authorized Worker to inform them the lockout device needs to be removed;
  c. Inspect the work area ensuring non-essential items have been removed; and
  d. Verify the equipment is operationally intact and safe to return to service.

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- A written record of such removal must be kept on file (Appendix C - Abandoned Lock Removal Form). A copy of this form must be posted at the machine lockout point for at least 24 hours.
- The Manager/Supervisor must inform the authorized worker upon returning to the facility their personal lockout device has been removed from the equipment.
- Where the key to a lockout device is lost, it must be removed in the presence of the Authorized Worker who owns the device

Change of Authorized Worker

Both incoming and outgoing Authorized Workers must notify the affected employees of the change in personnel ensuring all employees involved are aware of who is performing service or maintenance activities and who is responsible for the control of hazardous energy tasks.

- The outgoing Authorized Worker is to remove their personal lockout device and the incoming individual is to attach their personal lockout device to the energy isolating device identified in the procedure.
- The incoming Authorized Worker must verify that all energy sources remain isolated or controlled prior to starting work, and must ensure that the equipment is clear of all other personnel before doing so.
- If the zero energy state is no longer in place, the Authorized Worker must initiate the equipment specific procedure from the start to achieve a successful control of hazardous energy.

Periodic Audits

- At least annually, each Supervisor shall designate or conduct an audit of a lockout by each Authorized Worker in an effort to verify compliance with the lockout procedure.
- Where deficiencies are noted during the audits, retraining shall be required.
- If a trend or significant number of deficiencies are noted during the audits, then retraining of all Authorized Workers will be required.
- For each audit, the auditor will document the date, names of Authorized Workers, auditors name, equipment, and any deficiencies noted (see Appendix D - Lockout Audit Form).
- The auditor will sign the audit report and send to their Manager for review and filing.

Training

Different levels of training shall be provided to workers depending on their involvement in or exposure to machines or equipment within the scope of this procedure. Documentation shall be maintained on all training activities, i.e. date, each worker's name, signature, instructor's name, and information reviewed.

Authorized Workers

- Workers and Supervisors who will use this procedure shall be provided training to ensure they are capable of recognizing hazardous energy sources,

types and magnitude of each source found in the work place and the methods and means to properly isolate, identify and control such energy.
- All new and transferred workers shall receive the training prior to their first work assignment requiring energy lockout.

Affected Workers

- All others workers working in the facility where a lockout procedure is used, shall be educated in the existence and purpose of the written lockout procedure and instructed to never attempt to restart or re-energize equipment or processes where a lock and/ or tag is in use.
- All workers shall receive such training initially when hired.

Re-Training

- To assure worker competency in the lockout procedure, all Authorized Workers shall receive re-training in general and equipment specific lockout under the following conditions:
    - No less than every three years, or sooner should any of the following conditions apply:
        - Anytime a new hazard is introduced through a job change, equipment or process change, etc.
        - Whenever the energy control procedure changes.
        - Whenever the inspection audit reveals program deficiencies/ deviations or inadequacies. If the inspection reveals inadequacies in a worker's knowledge as to proper use of the procedures the specific worker shall receive re-instruction immediately.

Reference Documents

CSA Standard Z460-13 Control of Hazardous Energy- Lockout and Other Methods

Occupational Health and Safety Act, R.S.O. 1990, c. O.1

R.R.O. 1990, Reg. 851: INDUSTRIAL ESTABLISHMENTS

O. Reg. 213/91: CONSTRUCTION PROJECTS

Revision History

Document Owner	Issue / Revised Date	Reason For Changes
Health & Safety	February 7, 2007	Initial draft
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Appendices