1.0 Introduction

Lock out is the common terminology for the practice of disabling and isolating an energy source prior to permitting personnel to work on and/or be exposed to the energy source. There are two main forms of energy; kinetic and potential. Kinetic energy sources include electrical, thermal [heat], radiant [light] and sound. Potential energy sources include chemical, suspended, pressurized, magnetic, mechanical, elastic and nuclear [radiation].

All forms of energy carry risk which if not properly controlled can cause an unexpected and unwanted release of energy with potentially fatal consequences. Prevailing OH&S legislation and good business practices dictate that all reasonable efforts should be taken to ensure energy sources are controlled and appropriate safeguards are in place to prevent unexpected or unwanted energy release.

2.0 Scope

Lock out procedures are the means for controlling the various energy sources in the workplace. All Simon Fraser University [SFU] personnel are required to follow the lock out procedures established in this program.

Contractors being protected by lock outs under the direction and control of SFU are also required to comply with these procedures. Contractors working at SFU are required to have lock out procedures in place to provide protection for their employees and any other personnel who need to be protected from the energy source.

3.0 Definitions

**Breaker** means a device for interrupting an electric circuit to prevent excessive current, as that caused by a short circuit, from damaging the apparatus in the circuit or from causing a fire.

**Lock** means the uniquely keyed lock which is used by a specific person to apply to the isolating device. Combination locks or locks with common keys may not be used for lock outs.

**Lock out** means the process of controlling an energy source so as to prevent it from being able to release the energy.

**Isolating device** means the device that physically prevents the transmission or release of the energy. Examples of isolating devices includes circuit breakers, switches and valves,

**Multi lock Hasp or Scissor** means the device which permits multiple individuals to apply their locks to the same isolating device or lock box,
Tagout means the process of installing an identification tag on the isolating device to identify the person(s) who have installed the isolating device(s). Tags typically include the name and employer of the person owning the lock as well as contact information, date/time of installation of lock and date/time for planned removal of lock. Tags may also include the workers Supervisor information.

Variable Frequency Drive [VFD] also known as Variable Speed Drive [VSD] means a type of adjustable-speed used in electro-mechanical drive systems to control AC motor speed and torque by varying motor input frequency and voltage.

Direct Digital Controls [DDC] means an automated system that controls the operation of a Heating, Ventilation and Air Conditioning [HVAC] system.

4.0 Roles and Responsibilities

4.1 Employer

The employer is responsible for having lock out procedures in place which properly identify the lock out actions to be performed by their employees and others being protected by the lock out. The lock out procedures must be documented and effectively communicated to employees and others prior to initiating the lock out. The employer is responsible to:

- Train their employees in lock out procedures
- Verify that all other persons performing lock out on an employer controlled system, equipment or device have received the proper training in lock out procedures from their respective employers.
- For issuing locks to all employees that engage in lock outs. The locks must be individually keyed and tagged in such a manner to identify the owner and to indicate whose lock is in use as well as to provide contact information in case the lock is not removed. The person issued the lock must retain control of the key for as long as the lock out is in effect.
SFU Lock-Out Procedure

4.2 Supervisors

The Supervisor is responsible to control and monitor the lock out process and to ensure that all persons intended to be protected by the lockout have applied their individual locks. The supervisor is responsible to:

- Ensure the locks are applied to the correct isolation points in the correct sequence,
- Ensure that all persons performing the lock out are competent to perform the lock out.

The lock out must remain in place for the duration of the work on the isolated system.

When the work is to be carried on by another shift, the oncoming shift must install their locks before the outgoing shift removes their locks. The employer is responsible for ensuring that a qualified Supervisor controls and oversees the removal and replacement of locks.

4.3 Workers:

It is the responsibility of each person engaged in the lock out to ensure that the system, equipment or device they are intending to work on is properly locked out and that their individual locks/tags are installed prior to commencing work on the system or equipment,

Removal of a lock is the sole responsibility of the person who applied the lock.

- A qualified Supervisor may remove an individual’s lock only if every reasonable measure has been made to contact the lock Owner. In this case, the Supervisor must first confirm the area and equipment are safe and no danger is caused by the removal of the lock. An Emergency Lock out Removal Report must be completed and signed by the Supervisor before removing the lock.

4.4 Contractors

- A contractor undertaking work for SFU has the prime responsibility for ensuring that their workers are familiar with and comply with these Lock-out and Tagging Procedures (and with the WorkSafeBC Regulations).
- Where the work of a contractor and SFU personnel overlaps and lock-out is anticipated, a pre-job meeting must be held to discuss the specific responsibilities of both parties. Simon Fraser University personnel will be the first to install and the last to remove their personal locks. Accordingly the SFU representative who removes the lock last shall ensure that the equipment or machinery can be operated safely.
- Where a contractor needs to lock out equipment independent of SFU staff, they shall abide at minimum by these procedures, and advise SFU foreman of the lock-out.
- This Lock-out and Tagging Procedure is a minimum requirement and does not relieve the Contractor from complying with their corporate lock-out procedures where they exceed these standards.
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5.0 General Requirements

Lock out requirements come into effect when a system, process and/or piece of equipment represents a potential hazard to life and property, and applies to all energy sources. No person is permitted to work on, enter, or encroach within the safe limits of the energy source until the energy source is locked out in such a manner that makes it inoperable and effectively prevents the release of the energy.

- No person may perform a lock out unless they are properly trained and qualified to perform the lock out in the prescribed manner and in accordance with prevailing legislation,
  - Training and qualification is commensurate on the degree of participation in isolating the energy source. For example, persons who apply locks/tags directly to the isolating device will require a higher degree of training/qualification than personnel applying locks/tags to a lockbox,
- A qualified and knowledgeable Supervisor must control and monitor the implementation of the lock out for all personnel being protected by the lock out,
  - The Supervisor must control and monitor the removal of the lock out in accordance with the stipulated lock out removal procedures,
- A qualified and knowledgeable person must identify the isolating device(s) which must be rendered inoperable by the lock out,
  - The qualified person must communicate to the Supervisor the specific isolating devices, locations of devices, progression of isolation and means by which the locks are to be applied [ie; single lock, hasp, scissor]
- All persons being protected by the lock out must place their individually issued/keyed locks and tags on all lock out points, as directed by the Supervisor,
  - All personnel must record their name, employer, date of application of lock and contact information on the tag(s). Tag(s) must be affixed to the individual’s lock.
  - All persons must remove their own locks and tags on the completion of the lock out in accordance with the lock out removal procedures described in this program,
- All locks must be individually keyed. Combination locks are not permitted.
- The Person in Charge must test the system being isolated to ensure the energy source is properly isolated before permitting personnel to work on, enter or encroach within the safe limits of the energy source,

REMEMBER: STOP IT, LOCK IT, TEST IT
6.0 Lock-out Tags

Below are examples of acceptable lock-out tags (Figure 1 and 2). Tags should highlight that the equipment is locked out, warn employees not to operate the equipment, and indicate the name of the person who applies a lock on the equipment and the date of lock-out. Any additional information related to the lock-out or equipment may be provided on the back of the tag.
7.0 Lock Removal by Others

Circumstances may arise where a worker who applied a lock/tag is unable to remove the lock. The worker may have gone home sick, been injured and not on the site, was terminated before removing his/her lock, left work without realizing he/she needed to remove his/her lock and so forth. In this circumstance the following procedure can be used to remove the absent workers’ lock/tag.

The Supervisor of the absent worker must take every reasonable effort to contact the absent worker and have him/her return to work and remove his/her lock,

- If the Supervisor of the absent worker is not able to reach the worker, the Supervisor must search the entire area where the lock out is in place to ensure the worker is not present,
- The Supervisor of the absent worker must thoroughly check the work performed by the absent worker to verify that the work is completed and/or will not be compromised and/or cause damage when the energy is restored to the system/equipment,
- The Supervisor of the absent worker must inspect the work area to confirm the absent worker has not left any tools, equipment or materials which may compromise the safe restoration of the energy, systems or equipment,
- The Supervisor must complete the Lock Removal by Others form, recording all the pertinent information regarding the efforts to contact the absent worker and verifying that the worker has not left anything behind which would compromise the removal of the lock out.
- The Supervisor of the absent worker must provide a completed copy of the Lock Removal by Others form to the Supervisor of the Lock Out,
- After completing the preceding actions, and subject to the approval of the Supervisor of the Lock Out, the Supervisor of the absent worker can proceed with removal of the absent worker’s lock.
- The removal of the lock must be witnessed by another person and both the Supervisor of the absent worker and the witness must sign the Lock Removal by Others form.
- Copies of the completed and signed Lock Removal by Others form is to be sent to the SFU EHRS Department and as requested by any of the parties.
- The absent worker, on his/her return to work, must be informed of the removal.
**Lock Removal Authorization**

**THIS FORM MUST BE COMPLETED FOR ALL CASES WHERE A LOCK IS BEING REMOVED BY ANYONE OTHER THAN THE PERSON WHO ORIGINALLY INSTALLED THE LOCK**

<table>
<thead>
<tr>
<th>Name of Absent Worker who’s lock is being removed:</th>
<th>Date:</th>
<th>Worker Contact #:</th>
<th>Supervisor name:</th>
<th>Supervisor Cell #:</th>
</tr>
</thead>
</table>

**Reason why the Worker is unable to remove their lock:**

- [ ] Absent from Illness
- [ ] Absent from Injury
- [ ] Suspension/Termination
- [ ] Absent with notification
- [ ] Absent without notification
- [ ] Unknown

**Describe actions taken to contact Absent Worker**

**Date/Time of 1st attempted contact:**

**Date/Time of 2nd attempted contact:**

**Person who tried to contact worker:**

**Title/Position:**

**Employer:**

**Cell #:**

**Lock Out Information: USE ADDITIONAL PAGES AS NECESSARY TO RECORD ALL LOCKS BEING REMOVED**

<table>
<thead>
<tr>
<th>Location of Lock(s) being removed</th>
<th>System/Devices being protected by Lock Out</th>
<th>Date Lock Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Confirmations: ALL QUESTIONS MUST BE ANSWERED YES BEFORE REMOVING LOCK**

- Has every effort been made to contact the Worker and have him/her return and removed his/her lock?  [ ] Yes  [ ] No
- If the Worker was contacted, did he/she confirm that he/she was unable/unwilling to return and remove his/her lock? Check “not reached” if unable to contact the worker.
  - [ ] Yes  [ ] No
  - [ ] not reached
- Has the Workers’ Supervisor confirmed that the work performed by the Worker was completed or is in a condition which permits the system/device to be re-energized without risk to persons or equipment?  [ ] Yes  [ ] No
- Has the Workers’ Supervisor confirmed that the Worker did not leave any tools, equipment or materials behind which could adversely affect the system/device being re-energized?  [ ] Yes  [ ] No

**Person removing lock:**

**Signature:**

**Employer:**

**Cell #:**

**Date/Time lock removed:**

at  [ ] am  [ ] pm
 SFU Lock-Out Procedure

6.0 Lock-Out Procedures

6.1 Preparation for Lock-Out

Employees performing lock-out shall be certain as to which switch, valve or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, hydraulic or pneumatic) may be involved. Any questionable identification of sources shall be clarified by the employees with their supervisors.

Personal locks issued to a worker shall only be opened by a unique key, or by a master key held by the Foreman for emergency use only. Combination locks shall not be used.

6.2 Sequence of Lock-Out Procedure

1. Notify all affected personnel that a lock-out is required and the reason for locking out.
2. If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.). Operate the switch, valve, or other energy isolating device so that the energy source(s) is disconnected or isolated from the equipment. **Power must be disconnected and tested at the drive/motor or at the MCC. VFD’s are NOT acceptable lock-out locations.**
3. 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 or restrained by methods such as grounding, repositioning, blocking, bleeding, etc. Stop buttons on equipment are not acceptable isolating devices.
4. Lock-out the energy isolating device with the personal lock. More than one person may apply a personal lock using “scissors”. Hand Wheels on valves required to isolate energy sources must be isolated with chains or appropriate devices and locked with scissors and personal locks to prevent unauthorized opening.
5. Tag the lock identifying the date of application and the individual applying the lock.
6. Note: Verify lock-out at the source. For example; computer screen digital controls are not a means of verification.
7. After ensuring that no personnel are exposed, operate the push button or other normal operating controls to ensure that the equipment will not operate.
8. The equipment is now locked-out.

6.3 Procedures for Multi-day Lockout

If lock-out must continue beyond the end of the day, the personal lock(s) shall be removed and replaced with a departmental lock. Each individual applying a departmental lock shall enter their “name”, “date”, “location” and “equipment locked-out” in the Departmental Lock-Out log book by the end of the shift.
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This lock can be installed by the same person or another person. It is designed to protect the equipment, not the individual. This lock shall remain on until a worker actively works on the equipment again. A worker cannot work on the equipment again until a personal lock has been applied. Prior to starting work again, de-energization and lock-out sequence should be verified.

If multiple departments require multi-day lockout each individual department should apply their own departmental lock and record in the log book.

6.4 Removal of Personal Locks

A personal locks shall only be removed by the person who installed it, or in an emergency, the foreman or his designate. They shall first make every effort to contact the individual who put the lock on, and ensure that the machinery or equipment can be operated safely. If someone else must remove the lock, the “Lock Removal by Others Form“ must be completed and returned to their supervisor.

6.5 Restoring Equipment to Service

When the job is complete and the equipment is ready for testing or normal service, check the area to ensure that the equipment can be safely operated and all personnel are clear of the area. Only then may the energy isolating devices be operated to restore energy to the equipment.

6.6 Procedures for Vehicle Lockout

Due to the nature and unique aspects of vehicle maintenance and servicing activities the following steps should be taken prior to conducting maintenance work:

- Vehicle key(s) to be kept under the exclusive control of the person conducting the vehicle maintenance work
- Vehicle lockout tag is applied to the steering wheel, indicating the name and date of the person who has locked out the vehicle.
- If multiple employees are required to work on a vehicle the vehicle key(s) should be secured in a locked box with each individuals personal lock applied during maintenance activities.
- See procedures above for lockout over multiple days.

Note, while the above procedures are intended to ensure protection form the inadvertent start-up of a vehicle, controls must be implemented to ensure other energy sources, independent of the vehicle ignition, are isolated as required e.g. chemical energy due to contact with battery acid, fire and explosion hazards with fuel and fluid systems, gravitational energy caused by elevated vehicles, etc.