



Lockout / Tag Out Safe Work Practice – Best Practice 004

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Lockout / Tag Out

1.0 Statement

This Standard deals with isolating all energy sources from equipment that employees and contractors are required to work on, so that no one is injured, no equipment is damaged, no production time is lost and no spillage occurs to the environment.

2.0 Objective

The objective of this Lockout / Tag Out Standard is to provide the necessary guidance and direction to employees in an effort to prevent injury and/or death during servicing or maintenance activities.

3.0 Scope

The conditions of this Standard shall be applied at all School District No. 22 work sites.

4.0 Responsibility

Management's Responsibility

It is the responsibility of management to ensure that a Lockout / Tag Out Site-Specific Procedure (SSP) is developed for all work locations and mobile equipment and that it is read and understood by all supervisors, employees, and contractors who may be affected by it. It is also the responsibility of management to provide the resources necessary for all work locations to effectively implement this safe work practice.

Supervisor's Responsibility

It is the responsibility of supervisors to apply and enforce this safe work practice. To do this, supervisors must ensure that employees and contractors have been thoroughly familiarized with the program and associated procedures and that management has been made aware of any deficiencies. Supervisors are also responsible for developing equipment-specific lockout procedures as detailed in this program.

Workers' Responsibilities

At all times, it is the responsibility of workers to apply the conditions and requirements of this Lockout / Tag Out safe work practice and any associated site



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specific procedures, and to inform supervisors of any problems or deficiencies in its application.

5.0 Definitions

Lockout / Tag Out (LOTO): A system of preventing injury or death from the accidental activation of equipment during servicing or maintenance. To be effective, LOTO must incorporate the following key elements:

Notification:	Prior to removing equipment from service, all affected workers must be informed of this occurrence.
Withdrawal from Service:	Shut down in accordance with manufacturer's specifications or safe operating procedures.
Isolation of All Energy Sources:	Blocking, isolating, or de-energizing.
Locking and Tagging:	Appropriate securement and identification.
Test Start:	Ensures equipment will not start after isolation.
Restoration to Service:	Safely bringing the equipment back online.

Note: Each of these key elements will now be covered in detail.

6.0 Training

Authorized employees or contractors who are required to do servicing and maintenance on equipment require training related to site specific Lockout / Tag Out procedures and equipment-specific LOTO procedures. They must be competent to apply LOTO and de-energize / isolate that particular equipment.

7.0 Resources and Equipment

Isolation Devices

Specialized Lockout / Tag Out materials are commercially available from most safety supply vendors and cover a wide range of products suited to most types of isolation devices.



7.1 Locks

- Locks are to be a high quality pin type (combination locks are not acceptable) and each lock is to be keyed differently;
- Master keys are prohibited. The lock holder should be the only person in possession of the unique key to the specific lock;
- Each lock should be permanently marked with a number, colour code, or name to allow for quick identification of the lock holder; and
- Locks should be stored on a lock station.

7.2 Scissors and Lock Boxes

Where more than one worker will be participating in the work to be performed, each will apply their own individually keyed lock to the isolation point. (More on multi locks in the locking and tagging section in this guideline.)

In some cases, it will not be possible to apply multiple locks to the isolation point. In these cases, devices such as scissors and lock boxes are used.

a) Scissors

Scissors can be applied to most hasps and other devices that can be secured with a padlock. The scissors allow more than one lock to be placed on a lockout, as would be the case if two or more workers were performing maintenance on the locked out equipment.

b) Lock Boxes

Lock boxes enable several workers to lockout a piece of equipment with one lock, place the key to that lock into the lock box, and then secure the lock box with multiple locks.

c) Circuit Breaker Lockouts

Each work location shall have at its disposal lockout supplies which are most suited to the types of equipment and energy sources that may need to be locked out at that work site.

7.3 Control Mechanism

A control mechanism must be devised and implemented that will ensure isolation devices, locks, and tags are accounted for on completion of the work activity. The control mechanism is a log sheet/book.



8.0 Notification

8.1 Advance Notice - Communication

Prior to taking any piece of equipment offline, all workers who may be affected by the shutdown, shall be notified in advance by the worker responsible for the lockout / tag out. Notification should include: equipment and energy sources involved in the shutdown, length of time off-line, and the fact that locks and tags will be applied.

8.2 Pre-Job Safety Meeting

For lockout jobs involving high hazard work or unusual circumstances, a pre-job safety meeting shall be conducted for all affected workers before shutting down and prior to lockout / tag out of affected equipment.

9.0 Withdrawal from Service

Only workers who are authorized may shut down equipment and apply LOTO.

Authorized workers shall be specifically trained in the shutdown of that particular piece of equipment according to the manufacturer's specification and/or the School District's safe operating procedures.

10.0 Isolation of Energy Sources

A key component of LOTO is the isolation and/or zeroing of all energy sources associated with a particular piece of equipment. It is imperative that all energy sources are considered and blocked, isolated, or de-energized.

10.1 Electricity

Electricity is a common energy source and can be isolated in a number of ways:

- Shut off and lock the breaker;
- Pull and lock the plug;
- Shut off and lock the generator;
- Pull and lock all fuses; or
- Ground/discharge capacitors.



10.2 Hydraulic Energy

Hydraulic energy (fluid under pressure) is another energy source that may need to be isolated. Hydraulic energy can be isolated in the following ways:

- Lower moving parts to lowest energy position. (If work to be done requires parts to remain in a raised position, then the parts must be securely blocked.);
- Shut down and lock out the prime mover for the pump;
- Open pressure bleed lines and lock them open;
- Blind/block pipe ends or flanges upstream of work to be done; or
- Close and lock hand wheels, butterfly valves, or ball valves upstream of the work.

10.3 Pneumatic Energy

Pneumatic energy is air (or other gas) under pressure. Compressed air can be a hazardous source of energy. Compressed air systems can be isolated in the same way that hydraulic systems are. Care must be taken to ensure that all residual compressed air is bled from the system after isolation is in place and prior to maintenance work commencing.

10.4 Potential Energy

Potential energy is the energy stored in an elevated object. The only way to isolate potential energy is to either lower the object to ground level, or block or brace the object in its elevated position.

10.5 Kinetic Energy

This is the energy stored in an object in motion such as a rotating fan, electric motor, or flywheel. The object may continue to move several minutes after shut down until all kinetic energy has dissipated. Some equipment may have a brake that can be applied to kinetic energy sources; however, in most cases, work must be delayed until all kinetic energy has dissipated.

10.6 Thermal Energy

Thermal energy is the transference of heat, whether by conduction, convection, or radiation. It is a stored form of energy that must be guarded against. The two methods for dealing with thermal energy are direct cooling and natural dissipation over time.

10.7 Chemical Energy

Chemical energy often refers to the reaction of one substance with another. Care must be taken to ensure that if a chemical is to be used in the maintenance routine, then the MSDS is consulted first for information pertaining to reactivity and safe handling.



11.0 Locking and Tagging

11.1 Signs

All lockout points should be appropriately identified so that workers are familiar with their position and condition. Preferably, signage is provided on both the equipment and the switchgear clearly stating which switchgear serves which equipment.

11.2 Isolation of Controls

Where operator controls (e.g., local start / stop stations) present the best solution for isolation of that piece of equipment:

- Turn the controls to the 'off' position;
- Lock the controls in the 'off' position;

Note: If the controls cannot be locked in the off position, then another source of lockable isolation must be found.

- If the controls are reversing controls, then they should be locked in both directions;
- If the controls are equipped with an override, then the override must be locked out and a tag indicating lockout placed on the controls; or

11.3 Locking Out Power Supply

When locking out the power supply is the best method of isolation, the following procedure shall be applied:

- It is imperative the equipment to be locked out is first shut down at its controls. If the machine is still running when the power supply is turned off, an electric arc produced at the electrical junction box can result in serious injury;
- Lock and tag the switch in the off position.

11.4 Motor Vehicle Ignition Keys

When the equipment to be locked out is a vehicle or other mobile equipment, the keys shall be removed from the ignition and, if only one person will work on that equipment, the ignition keys shall remain in that person's possession until the work is completed.

If more than one person will work on the equipment, the ignition key shall be placed in a lock box, and each worker will place an individual lock on the lock



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box. In addition to isolating the ignition, the brake shall be applied and the wheels blocked to prevent the release of potential energy. If the equipment is to be jacked up, it will be blocked in the elevated position to prevent the release of potential energy.

11.5 Valve Locks and Blinding Methods

When the equipment to be locked out requires the isolation of hydraulic or pneumatic energy, appropriate valve locks and blinding methods shall be used. If more than one person will be working on the equipment, then the valve lock key shall be placed in a lock box, and each worker shall place their individual padlock on the lock box.

11.6 Tagging

Tags shall be applied at the point of lockout. In addition, a tag shall be placed on the equipment operating controls if they are located separately from the energy isolation point.

Tags shall:

- Have the name and signature of the worker installing the lockout and performing the work written on them. In the case of a group lockout, the supervisor will sign the tag;
- Show the date of the lockout and estimated completion time;
- Include the name of the equipment being serviced;
- Be legible and understandable; and
- Be securely attached.

Tags and/or plastic tie straps shall **never be used as a lockout device.**

12.0 Test Start

Once equipment has been locked out and tagged, the “authorized worker” shall ensure all employees and tools are clear, then test (bump) start the locked out equipment as a final check to ensure that the lockout is successful.

13.0 Extraordinary Circumstances

13.1 Shift Change

Occasionally, a lockout may be in place during a shift change. If this is the case, the workers going off-shift shall remove their personal locks, and the workers



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going on-shift will apply their personal locks. A thorough shift change briefing is required so that on-coming supervisors, authorized workers, and affected workers are fully aware of the lockout in place.

13.2 Authorized Worker has Left the Work Site

It is possible that a lock will be left in place after an authorized worker has left the work site. In such cases, the supervisor will only remove the lock after careful consideration of the circumstances and attempts to contact the authorized worker have failed. The worker whose lock was removed, shall be so informed at the earliest possible opportunity.

13.3 Recording Extraordinary Activities

All extraordinary activities shall be recorded in the supervisor's log book.

14.0 Compliance

All management, supervisors, employees, and contractors shall follow this safe work practice. Where questions relating to applicability or procedure arise, these will be directed to local management as soon as possible.

15.0 Returning Equipment to Operation

- a) A person must not remove a lock from locked out equipment unless the person is the worker who installed it.
- b) Despite subsection (1), in an emergency, or if the worker who installed a lock is not available, a competent worker designated by the employer may remove the lock.
- c) A worker must not remove the lock until the worker ensures that no workers will be in danger if it is removed.
- d) A worker must not return equipment to operation after it has been locked out, locked out and tagged, or rendered inoperable until the worker ensures that no workers will be in danger if it is returned to operation.
- e) Communicating with all affected workers and ensuring that everyone is aware that the "system" is live is paramount.



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16.0 Related References

- British Columbia Occupational Health and Safety Regulations Part 10: De-energization and Lockout. <http://www2.worksafebc.com/Publications/OHSRegulation/Home.asp>.
- OSHA Standard for Control of Hazardous Energy Sources. http://www.osha.gov/OshDoc/data_General_Facts/factsheet-lockout-tagout.pdf.