



Lock-Out Tag-Out Training

Participants Workbook

WorkSafe Consulting Services

Participant Name: _____



WorkSafe Consulting Services Presents - Lock-Out Tag-Out Training.

WorkSafe Consulting Services is committed to helping Employers and Employees to take a pro-active approach to loss prevention in the workplace.

Lock-Out Tag-Out Training

Introduction

Instructional Objectives:

In this module participants will learn:

- A.) What is lock out tag out;
- B.) How to recognize hazards associated with all energy sources, specific to the workplace;
- C.) How to identify and assess the sources of energy requiring lock out tag out
- D.) How to understand legislative responsibilities of workplace parties.
Following the OHSA, the Regulations, CSA standards and any guidelines/policies and procedures that are relative to the work being performed.
- E.) What controls need to be in place to ensure the safety of all workers.

Relevance

Protection from harm or injury at work is an important component of individual well-being. Injuries at work often involve significant costs to the individual, the employer, and the community.

Summary

- National Picture — One in every 68 employed workers in 2020 was injured or harmed on the job and received workers compensation as a result.[1]
- Gender — In 2020, men experienced a higher rate of injury (18.8 cases per 1,000 employed men) than did women (11.2 cases per 1,000 employed women).
- Industries — In 2020, those working in construction had the highest rate of injury at 24.5 cases per 1,000 employees.
- Regions — In 2020, the highest rate of injury was in Manitoba (24.4 cases per 1000 employed workers), and the lowest was in Ontario (9.1 per 1,000 employed workers).

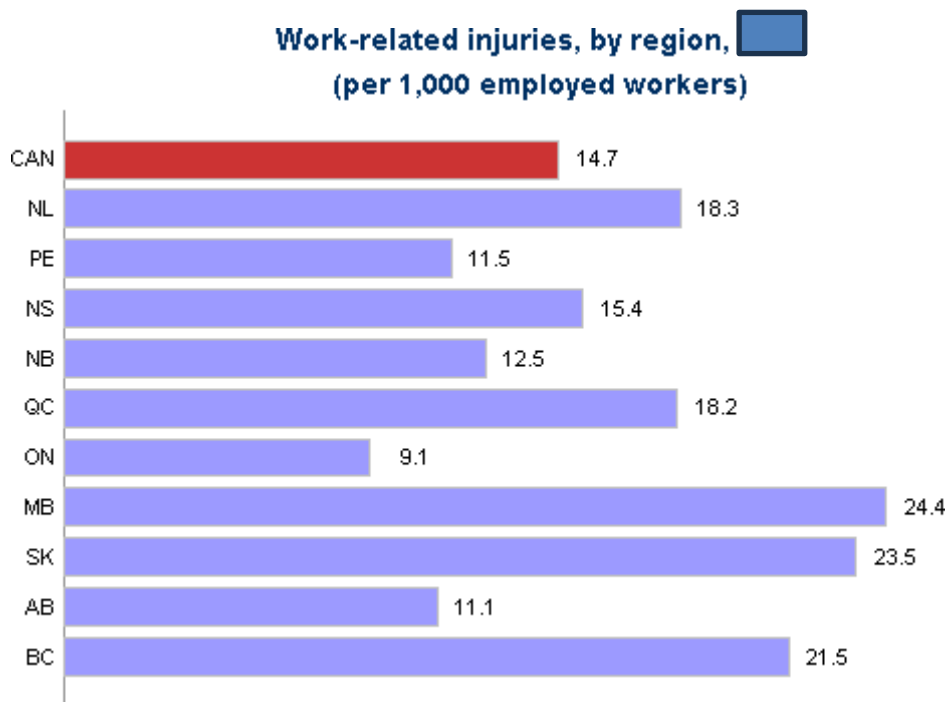
Lock-Out Tag-Out Training

Regions

Rates of injury varied from province to province in 2020. The types of industries in each province, as well as the types of jobs covered by provincial compensation, influence the rate of work-related injuries.

Ontario (9.1), Alberta (11.1), Prince Edward Island (11.5) and New Brunswick (12.5) had rates of injury below the national average of 14.7 injuries per 1,000 employed workers.

Rates were above the national average in Nova Scotia (15.4), Quebec (18.2), Newfoundland and Labrador (18.3), British Columbia (21.5), Saskatchewan (23.5), and Manitoba (24.4).



Source: HRSDC calculations based on data from Association of Workers' Compensation Boards of Canada. Available from: [Association of Workers' Compensation Boards of Canada](#) (cited July 2020); and Statistics Canada. *Labour force survey estimates (LFS), by sex and detailed age group, annual* (CANSIM Table 282-0002). Ottawa: Statistics Canada, 2020.

Lock-Out Tag-Out Training

Worksheet # 1

In your own words describe what is meant by "Lock Out".

List the operational reasons for a lockout in your workplace, e.g. machine repair.

List the energy sources that may require a lockout in your workplace, eg. Electrical.

Lock-Out Tag-Out Training

Video Presentation

" Lockout: A Guide to safe work practices"

http://www.youtube.com/watch?feature=player_embedded&v=KhCSUFMU5pM



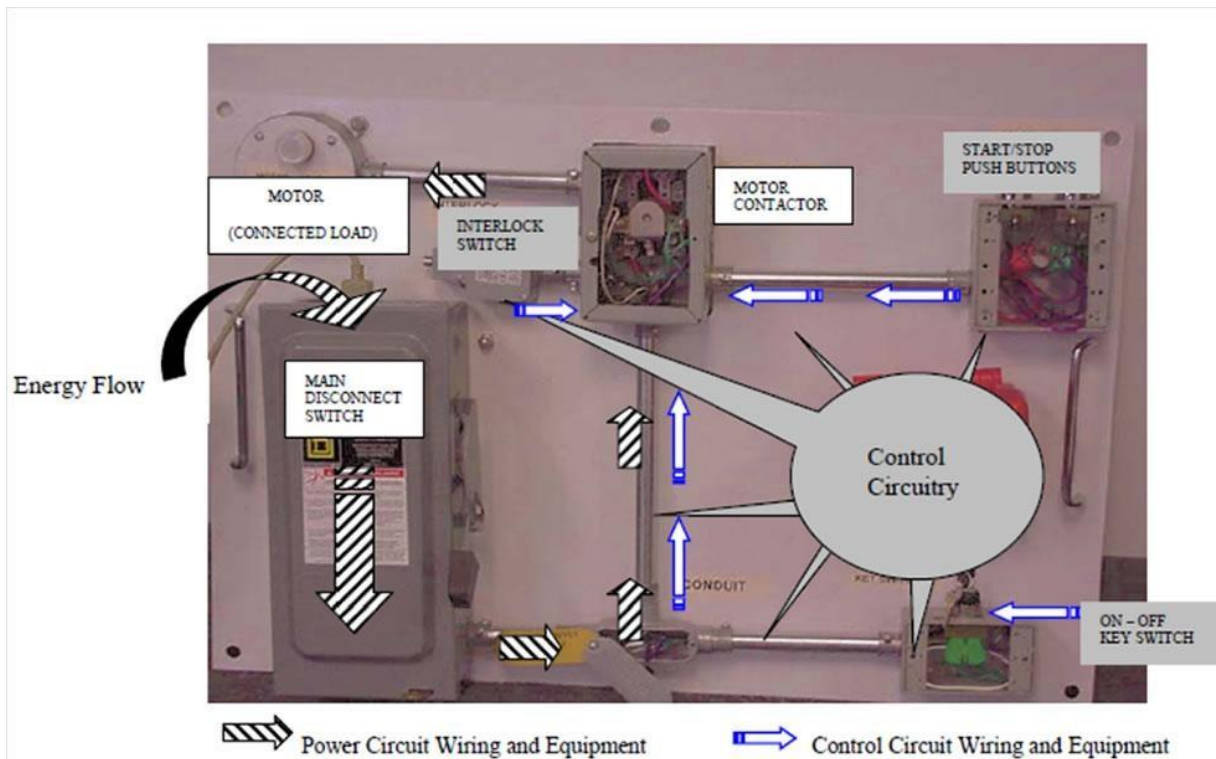
Duration: 36 minutes

Lock-Out Tag-Out Training

Electrical Terminology

Disconnect Switch

Should isolate equipment from electrical power supply when in the "off" position. Should be lockable in the "off" position. Notes: If you are right handed, you want to use your left hand to throw the disconnect, this forces you to turn away from the panel. We will discuss why? You need to understand your workplace specific energy flow. Why?



Lock-Out Tag-Out Training

Electrical Terminology

Lock

Used to lock the disconnect switch (and other energy sources) in "off" position. Normally locks used for personal protection should be personally assigned with only one key.

One Lock ➡ One Key ➡ One Person



Operational Process/Controls

As part of the lock out procedure, you need to lock it out, block it out but you also need to know it's out. Which means you need to go and try the "start button" to ensure it does not inadvertently start. Just because the main panel is in the same room, does not mean that the machine or equipment is actually wired to that main. It could be wired to another room or another area.

So do not ever make assumptions, this is how people get killed or injured.



Lock-Out Tag-Out Training

Tag

The tag is a means of communication, it is applied in lockout situations to identify the reason for the lockout, and it identifies the person locking out the machine. A tag will never replace the need for a lock.

Lack of communication is another reason people get killed or seriously injured.



LOCK OUT HASP

Tag is a Used to allow application of multiple locks in a lockout situation. Typically "scissors" type device made of steel. A number of workplaces rely on the hasp as a means of controlling the hazards, which allows for verification requirements before locks are removed. You could have an operator lock, a maintenance lock, a supervisor lock, an electrician lock etc. Usually the last lock to be removed would be the supervisor of the department. This would include the use of a procedure and a checklist which would be signed off on by each workplace party.



Lock-Out Tag-Out Training

Worksheet #2

Standard Electrical Lockout Procedure

You are required to change the blade on a 12" electrically powered table saw. Describe the minimum requirements that must be followed in applying the standard electrical lockout procedure.

<u>Step</u>	<u>Description</u>
1	
2	
3	
4	
5	Hint: Change the saw Blade
6	
7	
8	

There are eight steps, so list what the steps are up to # 5 Change the Saw Blade and then what are the steps after you have changed the saw blade.

Lock-Out Tag-Out Training

Worksheet # 3

Recognition of Lock Out Hazards

List three (3) main hazards associated with the application of lockout procedures and describe how you could prevent these hazards, list the hazard and list the preventative measures.

Hint:

Lack of Communication could be a hazard, by people failing to use a lock or failing to use and complete the tag. List the Preventative Measures.

<u>Hazard</u>	<u>Preventative Measure</u>
Lack of Communication- no lock and or no tag.	

Lock-Out Tag-Out Training

Understanding 'lockout' of other forms of energy in my workplace

" A major problem with the lockout process is that a number of companies fail to establish lock out procedures in the workplace, procedures are not always documented, if they are documented they often are not comprehensive enough (which means that they don't identify and control all other hazards including all energy sources) and the final problem is that workers are not taught workplace specific procedures."

So, in this exercise what we are doing is looking at your workplace lockout situations in a manner that will consider "all hazards" and then will allow us to determine what should be detailed in our lockout procedures relative to the piece of equipment being locked out.

We will look at what we mean by other Energy Sources

Identify, based on your workplace examples any other sources of energy that would need to be considered as part of your lock out procedures/program.

<u>Energy Form</u>	<u>Equipment Process</u>	<u>General Lockout Requirements</u>
Stored Electrical Energy (Capacitors)		
Pressurized Liquids (hydraulics, water, chemicals)		
Pressurized Gases (air, steam, other gases)		
Kinetic Energy (Fly Wheels, moving objects)		
Potential Energy (springs, raised loads)		

Lock-Out Tag-Out Training

Now, let's look at what the Law Says...

The Occupational Health and Safety Act

Established the requirements for all workplace parties in the workplace.

The Employer

- # 1 Is to establish safe work practices for the protection of a worker.
- # 2 Is to provide all equipment to ensure the protection of a worker. This means the employer is to provide lock out tag out systems.
- # 3 Provide information, instruction and supervision to a worker.
- # 4 Provide a safe work environment. Etc.

Lock-Out Tag-Out Training

The Supervisor

Is there to assist the Employer, so whatever the Employer is required to do under the Act, the Supervisor is the one who is there to enforce it (make sure it's being done and followed).

- # 1 Ensures that workers are following company policies and procedures.
- # 2 Ensures that workers are using all protective equipment necessary for the protection of a worker.
- #3 Provide "Competent Supervision" – oversees workers, the Supervisor will understand the hazards, will understand the law and will understand how to control the hazards.
- # 4 Will ensure all hazards identified are corrected.

The Employee

- #1 Will follow established company policies and procedures.
- # 2 Will use all required protective equipment.
- #3 Will report hazards to your Supervisor and not use or operate equipment that is likely to endanger yourself or another worker.
- # 4 Will not "jerry rig", remove a guard or protective device that might make the equipment/machine/device or thing unsafe.

Always refer to the Occupational Health and Safety Act for a complete list of required responsibilities for all workplace parties.

Lock-Out Tag-Out Training

The Regulations...

The Act tells you what to do, the Regulations tell you how to do it.

Ontario Regulations- Lock Out, Tag Out

40. Electrical equipment, insulating materials and conductors shall be,
- (a) suitable for their use; and
 - (b) certified by,
 - (i) the Canadian Standards Association, or
 - (ii) the Electrical Safety Authority, as defined in the *Electricity Act, 1998*.
R.R.O. 1990, Reg. 851, s. 40; O. Reg. 144/99, s. 2; O. Reg. 420/10, s. 6.
41. The entrance to a room or similar enclosure containing exposed live electrical parts shall have a conspicuous sign, warning of the danger, and forbidding entry by unauthorized persons. R.R.O. 1990, Reg. 851, s. 41.
42. (1) The power supply to electrical installations, equipment or conductors shall be disconnected, locked out of service and tagged before any work is done, and while it is being done, on or near live exposed parts of the installations, equipment or conductors. O. Reg. 630/94, s. 1.
- (2) Before beginning the work, each worker shall determine if the requirements of subsection (1) have been complied with. O. Reg. 630/94, s. 1.
- (3) Locking out is not required,
- (a) if the conductors are adequately grounded with a visible grounding mechanism; or
 - (b) if the voltage is less than 300 volts and there is no locking device for the circuit breakers or fuses and procedures are in place adequate to ensure that the circuit is not inadvertently energized. O. Reg. 630/94, s. 1.
- (4) If locking out is not required for the reason set out in clause (3)(b), the employer shall ensure that the procedures required by that clause are carried out. O. Reg. 630/94, s. 1.

Lock-Out Tag-Out Training

Lock Out Communication:

- (5) If more than one worker is involved in the work referred to in subsection (1), the worker who disconnected and locked out the power supply shall communicate the purpose and status of the disconnecting and locking out. O. Reg. 630/94, s. 1.
- (6) If a tag is used as a means of communication, the tag,
- (a) shall be made of non-conducting material;
 - (b) shall be secured to prevent its inadvertent removal;
 - (c) shall be placed in a conspicuous location;
 - (d) shall state the reason the switch is disconnected and locked out;
 - (e) shall show the name of the worker who disconnected and locked out the switch; and
 - (f) shall show the date on which the switch was disconnected and locked out. O. Reg. 630/94, s. 1.
- (7) The employer shall establish and implement written procedures for compliance with this section. O. Reg. 630/94, s. 1.

Lock-Out Tag-Out Training

Live Equipment and Arc Flash Protection:

- 42.1 (1) This section applies and section 42 does not apply if it is not practical to disconnect electrical installations, equipment or conductors from the power supply before working on, or near, live exposed parts of the installations, equipment or conductors. O. Reg. 630/94, s. 1.
- (2) The worker shall use rubber gloves, mats, shields and other protective equipment and procedures adequate to ensure protection from electrical shock and burns while performing the work. O. Reg. 630/94, s. 1.
- (3) If the installation, equipment or conductor is operating at a nominal voltage of 300 volts or more, a suitably equipped competent person who is able to recognize the hazards and perform rescue operations, including artificial respiration, shall be available and able to see the worker who is performing the work. O. Reg. 630/94, s. 1.
- (4) Subsection (3) does not apply to equipment testing and trouble-shooting operations. O. Reg. 630/94, s. 1.

Lock-Out Tag-Out Training

750 volts or more...

42.2 Work performed on electrical transmission systems or outdoor distribution systems rated at more than 750 volts shall be performed in accordance with,

- (a) the *Rule Book, Electric Utility Operations* published in 1990 by the Electrical Utilities Association of Ontario, Incorporated; or
- (b) the *Ontario Hydro Corporate Safety Rules and Policies*, dated 1994. O. Reg. 630/94, s. 1; O. Reg. 144/99, s. 3.

Tools and Equipment Safety:

43. Tools and other equipment that are capable of conducting electricity and endangering the safety of any worker shall not be used in such proximity to any live electrical installation or equipment that they might make electrical contact with the live conductor. R.R.O. 1990, Reg. 851, s. 43.

44. (1) Cord-connected electrical equipment and tools shall have a casing that is adequately grounded. O. Reg. 630/94, s. 2.

(2) Subsection (1) does not apply to cord-connected electrical equipment or tools that are adequately double-insulated and whose insulated casing shows no evidence of cracks or defects. O. Reg. 630/94, s. 2.

(3) Subsection (1) does not apply to a portable electrical generator in which the electrical equipment or tools are not exposed to an external electric power source if the casing of portable electrical equipment or tools connected to the generator is bonded to a non-current-carrying part of the generator. O. Reg. 420/10, s. 7.

44.1 When used outdoors or in wet locations, portable electrical tools shall be protected by a ground fault circuit interrupter installed at the receptacle or on the circuit at the panel. O. Reg. 630/94, s. 2.

44.2 A ground fault that may pose a hazard shall be investigated and removed without delay. O. Reg. 630/94, s. 2.

Lock-Out Tag-Out Training

How do we Control our Lock Out Hazards?

Procedure

According to *Ontario Regulations*, under the *Occupational Health and Safety Act*, workplaces must have a written lockout procedure for each machine that is cleaned, maintained, adjusted or repaired.

The procedure identifies the proper steps to follow in order to safely lock out the machine.

Lockout prevents injuries caused by the unexpected start-up or movement of a machine. These procedures must be followed each time an employee works on (cleans, maintains, adjusts, repairs) a machine.

If lockout is inappropriate, a code of practice must be followed. This code of practice must be established by the joint health and safety committee or health and safety representative (if any) in consultation with the employees, and, when applicable, must be followed so that the work can be carried out safely.

Policy

Ontario regulations require that workplaces have a Lock Out Policy. The policy should indicate precisely how the regulations will be applied. It should contain, but not necessarily be limited to, the following points:

- The types of activities and machines that require lockout.
- The necessary training for the person who will perform lockout on the machine and the employees who will work on the machine.
- How lockout procedures will be developed, reviewed and updated.
- The steps that must be followed in an emergency, when a lock must be removed by someone other than the person who installed it.
- How lockout will be enforced (for example, a disciplinary policy).

Lock-Out Tag-Out Training

Basic Steps

These steps should be followed in the order in which they appear. Perform only the steps that apply to the machine you are locking out.

Before you Begin Working on the Machine:

1. Turn off the machine at the operator's control panel.
2. If the operator's control panel is equipped with a lock, lock the panel and put the key in a safe place, on your person.
3. Shut off the power at the main power disconnect.
4. Put your padlock on the main power disconnect and keep the key to make sure no one can remove your lock and turn the power back on.



Remember: One key – One lock.

5. Place a tag on your lock that identifies you (by your name, picture or employee number) and the date and time you locked the machine out.
6. Release all stored energy from the system. Depending on the type of machine, there may still be several kinds of energy remaining after the power is turned off. The written lockout procedure should have a complete list of all these secondary energy sources and how to release energy from them.



Examples of releasing stored energy include; draining the air from an air tank, bleeding a hydraulic system, waiting for a circular saw blade to stop spinning, or placing blocks under an elevated weight.



Secondary energy sources may be hydraulic (fluid under pressure), pneumatic (air under pressure), kinetic (force of moving parts) or potential (force contained in weights that have been raised).

Lock-Out Tag-Out Training

7. Try to start or activate the machine to make sure that it is in a zero energy state and that the power is truly off.
8. Push the stop button again, after you have tested for power. You don't want the machine to be in the "on" position when the power is turned back on at the main power disconnect. You have now verified that the machine is in a zero energy state.



The bottom line before working on any machine:

Lock – Tag – Test

9. Secure the work area by replacing guards and shields, removing blocks, picking up tools and inspecting the work area. Make sure the machine is not in the "on" position.
10. Warn other affected employees that you will be removing your lock and tag from the main power disconnect and restarting the machine.
11. Take your lock and tag off the main power disconnect.
12. If there are no other locks on the main power disconnect, turn on the power, making sure to stand clear of the main power disconnect.
13. Unlock the operator's control panel if necessary.
14. Start the machine and proceed with your work.

Lock-Out Tag-Out Training

Other Types of Controls could include:

Isolation of the Hazard by:

Blanking – means to separate air/liquid or steam from a pipe, which is to hold it into a specific area. Use a metal plate between pipes to contain the hazard out of the way.



Bleeding means to release the air or hydraulic fluid, liquid or steam.



There are no short cuts to safety!



Lock -Out Tag-Out Quiz

Name: _____ Date: _____

Company: _____

Lock-Out/Tag-Out Quiz

1. Place numbers from 1 to 7 in the blanks indicating the correct order of steps to be taken in Lock-Out/Tag-Out!

___ Isolate equipment
___ Verify isolation
___ Control stored energy
___ Shut down equipment
___ Prepare for shutdown
___ Apply lock-Out/tag-Out devices
___ Removal of locks

True and False

2. Lock-Out/Tag-Out is a system used to ensure that equipment you've isolated and de-energized to work on remains shut down. True or False
3. In a Tag-Out, a tag is placed on all primary and secondary energy sources. True or False
4. You know the equipment is safe when the power has been shut down. True or False
5. It's a good idea to have a pre-job briefing with your co-workers before a lock-out operation. True or False
6. Locks should be removed only by the person who installed them. True or False
7. Kinetic energy is energy an object has when it is in motion. True or False
8. In preparing for a shutdown, gravity is not a concern. True or False

Multiple Choice – Circle all that apply.

9. Which of the following must an employee know before starting to work on a piece of equipment.
- a) types of energy to be controlled,
 - b) magnitude of energy to be controlled,
 - c) hazards of energy to be controlled,
 - d) method and means to control the energy.
10. Which of the following must be notified prior to equipment shutdown for repair?
- a) plant manager,
 - b) supervisor,
 - c) safety person,
 - d) affected employees.
11. Which of the following would be part of equipment *isolation*?
- a) closing valves,
 - b) locking out feeders,
 - c) turning off power,
 - d) releasing hydraulic pressure,
 - e) releasing steam pressure,
 - f) blocking movement of parts,
 - g) releasing spring tension.
12. Locks are located at each:
- a) electric panel,
 - b) switch,
 - c) water valve,
 - d) energy isolating device.
13. Which of the following would be part of control of stored energy?
- a) closing valves,
 - b) locking out feeders,
 - c) turning off power,
 - d) releasing hydraulic pressure,
 - e) releasing steam pressure,
 - f) blocking movement of parts,
 - g) releasing spring tension.
14. Verifying isolation involves:
- a) putting locks on the equipment,
 - b) putting a tag on the equipment,
 - c) attempting to turn the machine on.

Please complete the training feedback form.

Thank-You

Training Course Feedback Form

Course: _____ Course Date: _____

Instructor: _____ Company: _____

Rating: 1 = Very Poor 5 = Very Good

Administration

Category	Rating				
Course was scheduled at a good time	1	2	3	4	5
Course started on time	1	2	3	4	5
Course finished on time	1	2	3	4	5
Trainer took periodic breaks	1	2	3	4	5

Course Content

Category	Rating				
Course workbook was easy to understand	1	2	3	4	5
Course workbook was informative	1	2	3	4	5
Presentation was easy to understand	1	2	3	4	5
Presentation was informative	1	2	3	4	5

Instructor

Category	Rating				
Instructor presented material in ways that were easy to understand	1	2	3	4	5
Instructor answered questions clearly	1	2	3	4	5
Instructor encouraged active participation	1	2	3	4	5

Technology

Category	Rating				
I could clearly hear what the instructor was saying	1	2	3	4	5
I could clearly see what the instructor was doing	1	2	3	4	5
The technology was beneficial to the learning process, not a hindrance	1	2	3	4	5

**** Over All, This was a positive experience: 1 2 3 4 5**

Comments: _____
