

LOCK-OUT & TAG-OUT

Purpose:

To provide details of a recommended procedure by which consistent positive protection can be provided.

Scope:

1. The Occupational Health and Safety Act states:
Where the starting of – machine, device or thing may endanger the safety of a worker-
 - a) Control switches or other control mechanisms shall be locked out.
 - b) Other effective precautions necessary to prevent such starting shall be taken.
2. While the above regulation refers generally to the hazards associated with the accidental starting of a machine, etc. **this will be understood to include the possibility of injury from working near interconnecting machines or equipment** (in which case they too shall be shut down and locked out).

General:

1. Experience has shown that the accidental starting of machines while others are working on them is one of the major causes of amputations and fatalities. Work on machines is seldom routine. It is usually a sense of urgency. It may be a first experience for some workers. Certain installations may require several trades each working under different supervisor who have their own ideas regarding safety conditions. Workers may be separated or out of communication with those near the control switch. All of these factors contribute to the possibility of the accidental starting of a machine and emphasize the need for clearly defined procedures and responsibilities.
2. Nearly all machinery in mechanical rooms is remotely controlled and automatically started and stopped by temperature or pressure control therefore caution is required when working in these rooms.

What is lock-out & tag-out?

A lock-out & tag-out is a method of keeping equipment from being set in motion and endangering workers.

In lockout: - A disconnect switch, circuit breaker, valve or other energy-isolating mechanism is put in the safe or off position. Only approved locks and tags are to be used. **(All locks must have a white “DANGER” tag that identifies the worker)**

The energy-isolating device is placed in the safe position and a written warning is attached to it.

Personal Tags will be:

- White background
- durable to withstand wear
- Substantial, so it won't come off easily
- Capable of identifying the person who applied it.

Equipment Caution Tags will be:

- Yellow background
- durable to withstand wear
- Substantial, so it won't come off easily
- Capable of identifying the person who applied it.

When should you lock and/or tagout?

Lock-out & tag-out is necessary whenever you are working on and around any equipment and you could be injured by:

- Unexpected start-up of the equipment
- The release of stored energy.

Two examples: - When you must remove or bypass a guard or other safety device.
- When you must place any part of your body where you could be caught by moving machinery.

Locks and tags by themselves *do not de-energize equipment*. Attach them only after the machinery has been isolated from its energy sources.

Energy

- Energy is movement or the possibility of movement.
- Whether the power switch is on or off, energy of some sort is *always* present in any powered equipment.
- Energy can come from many different sources, but it is always one of two types:
 - Kinetic energy – the force caused by the motion of an object (spinning wheel)
 - Potential energy – the force stored in an object that isn't moving (a spring under tension)

Engineering

Some examples of protective engineering are:

- Machine guards
- Electrical disconnects
- Mechanical stops, such as pins and valves
- Engineering lockouts, which provide automatic protection against human error.

Any engineering safety feature can be defeated if you try.

- Never bypass an engineering lockout or let a co-worker do so.
- Never rely blindly on engineering safety features.

Procedure:

1. Preparation for Shutdown

Before you turn off any equipment in order to lock or tag it out, you must know:

- The types and amounts of energy that power it
- The hazards of that energy
- How the energy can be controlled.

2. Equipment Shutdown and Isolation

- Notify MCC (Maintenance Control Centre @ extension 3668) during regular working hours before turning off any equipment whether the equipment is in automatic or manual mode. Notify the shift engineer at the Central Heating Plant @ extension 3669 in the off hours or holidays.
- In automatic; have the MCC dispatcher or the shift engineer shutdown the equipment where possible
- Before you stop a piece of equipment,
 - make sure the switch you are about to pull is the right one
- Push the stop button or turn the selector switch to the off position
- Move the operating lever to the “OFF” position. (this should be a steady motion)
- Do Not Apply excessive force to the operating handle. If it is hard to operate get an electrician to have a look at it.
- Operate all energy-isolating devices to ensure that the equipment is isolated from its energy sources.
- Be sure to isolate *all* energy sources – secondary power supplies as well as the main one.

3. Application of Lockout/Tagout Devices

- All energy-isolating devices are to be locked and tagged.
- Only the standardized devices supplied by the university are to be used for lockout/tagout, and they are not to be used for anything else.
- Use a lockout device if your lock cannot be placed directly on the energy control.
- When locking out a piece of equipment, every employee in the work crew must attach his personal lock.
- More than one employee can lock out a single piece of equipment by using a multiple-lock hasp.
- When tags are used instead of locks, attach them at the same point as you would the lock.
- Fill tags out completely and correctly with: Name, Date, Trade, and Reason for lockout.

4. Control of Stored Energy

- Inspect the system to make sure all parts have stopped moving.
- Check for voltage and install ground wires.(if applicable)
- Relieve trapped pressure.
- Release the tension on springs, or block the movement of spring-driven parts.
- Block or brace parts that could fall because of gravity.
- Block parts in hydraulic and pneumatic systems that could move from loss of pressure.
- Bleed the lines and leave vent valves open.
- Drain process piping systems and close valves to prevent the flow of hazardous materials.
- If a line must be blocked where there is no valve, use a blank flange.
- Dissipate extreme cold or heat, or wear protective clothing.
- If stored energy can re-accumulate, monitor it to make sure it stays below hazardous levels.

5. Equipment-Isolation Verification

- Make sure all danger areas are clear of personnel.
- Verify that the main disconnect switch or circuit breaker can't be moved to the on position.
- Press all start buttons and other activating controls on the equipment itself.

Performing the Work

- Look ahead, and avoid doing anything that could re-activate the equipment.
- Don't bypass the lockout when putting in new piping or wiring.

Removing Lockout/Tagout

- Make sure the equipment is safe to operate.
 - Remove all tools from the work area.
 - Be sure the system is fully assembled.
- Safeguard all employees.
 - Make sure everyone is clear of the equipment.
 - Notify everyone who works in the area that the locks and tags are being removed.
- Remove the lockout/tagout devices. Each device must be *removed by the person who put it on*.
- Return all switches to their original positions.
- Notify the MCC or the shift engineer at the Central Heating Plant before you turn the equipment back on or request them to restart the equipment if required.

ALL PERSONAL LOCKS AND TAGS SHOULD BE REMOVED BEFORE YOU LEAVE TO GO HOME AND REPLACED WITH A YELLOW CAUTION TAG IF THE EQUIPMENT IS NOT READY OR UNSAFE TO OPERATE

ALL LOCKS ARE EQUIPPED WITH A KEY OVERRIDE. THIS KEY IS IN THE POSSESSION OF THE MANAGER, OF MAINTENANCE SERVICES AND WILL ONLY BE USED IN CASES WHERE THE EQUIPMENT IS READY FOR OPERATION, IS REQUIRED AND ALL OTHER EFFORTS TO REMOVE A LOCK HAVE BEEN EXHAUSTED.