

Lockout and Energy Isolation

De-energization and lockout

De-energization is removing energy from machinery or equipment. Lockout is the use of lock(s) to make machinery or equipment inoperable, or to isolate an energy source in accordance with a written procedure.

Maintenance is any work performed to keep machinery or equipment in a safe operating condition. This includes installing, repairing, cleaning, and lubricating the equipment, as well as clearing obstructions to the normal flow of material.

Why are de-energization and lockout important?

Every year, workers are seriously injured because machinery or equipment was not properly de-energized or locked out. This can cause electrocution, crushed limbs, severed fingers, even death.

What are your responsibilities?

If you work on machinery or equipment that requires lockout, you must follow written safe work procedures. Take the time to follow the procedures on page 2. These procedures will protect you from injury.

General Rule

If there is any potential for equipment or machinery to start up unexpectedly or release energy, then it can cause serious injury. To avoid injury, you must isolate and control the energy source.

Types of Hazardous Energy

Energy Type	Description and Example
Kinetic	Energy that is stored in moving equipment or materials. Example: Any object in motion, such as a moving vehicle or a cart rolling down a ramp.
Chemical	Energy released by a chemical reaction. Examples: Batteries convert stored chemical energy into electricity; gas combustion converts the stored chemical energy into light and heat.
Potential	Energy is stored in suspended, elevated, or in coiled materials. Examples: a hammer sitting on a step ladder rung or water held behind a dam.
Thermal	Energy in heat; found in steam, hot water, fire, gases, and liquefied gas. Examples: a boiler system.
Electrical	Electrical energy that is generated or stored. Examples of electrical energy sources: conductors, motors, and generators.
Radiation	Includes non-ionizing and ionizing Examples: light, lasers, and X-rays

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Locking out includes the following general steps. Before locking out, ask your supervisor for the specific lockout procedure and follow the manufacturer's guidelines.

Soft-wired lockout

1. Identify the machinery or equipment that needs to be locked out.
2. **Make sure that shutting off the equipment will not cause a hazard to other workers.**
Shut off the machine or equipment. Make sure that all moving parts come to a complete stop.
3. Unplug the machine.
4. Keep the power cord and plug in view and within your reach while working on the machine.
5. Try to start the machine. This step is critical; it will tell you if the lockout procedure is effective.
 - Make sure that everyone is in the clear and that no hazard will be created if the lockout is not effective.
 - If there is more than one person working on the machine, you must lock it out.

Relevant Legislation

- OHS Regulations Section 147 (2):
Locking Out
- Mining Regulations Section 10.21:
Lock-Out Procedures

Hard-wired lockout

1. Identify the machinery or equipment that will be locked out.
2. **Make sure that shutting off the equipment will not cause a hazard to other workers.** Shut off the machine or equipment. Make sure that all moving parts come to a complete stop.
3. Identify and de-activate the main energy-isolating device (such as a switch or valve) for each energy source by placing it in the "off" position. There may be more than one type of power, such as electric, pneumatic, or hydraulic; or the device may be interlocked.
4. Apply a personal lock with your ID tag to the energy isolating device for each energy source and secure all parts and attachments against inadvertent movement. Each worker must apply a personal lock unless group lockout procedures are followed. If one switch is within your exclusive and immediate control, a lock may not be required.
5. Try to start the machine, so you know that the lockout procedure is effective, and all live components have been de-energized. Test the lockout after each energy-isolating device is locked out or after a group of nearby devices is locked out. **Make sure all workers are in the clear and that no hazard will be created if the lockout is not effective.**

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