Lockout Procedures

'Lockout' means to physically neutralize all energies in a piece of equipment before beginning any maintenance or repair work. Lockouts generally involve:

- Stopping all energy flows (for example, by turning off switches, or valves on supply lines which are called energy-isolating devices)
- Locking switches and valves (i.e., putting lockout on those energy-isolating devices)
- Securing the machine, device, or power transmission line in a de-energized state (for example, by applying blocks or blanks, or bleeding hydraulic or pneumatic pressure from lines)

If a lockout is not performed, uncontrolled energies could cause:

- Electrocution (contact with live circuits)
- Cuts, bruises, crushing, amputations, death, resulting from:
  – Entanglement with belts, chains, conveyors, rollers, shafts, impellers
  – Entrapment by bulk materials from bins silos or hoppers – Drowning in liquids in vats or tanks
- Burns (contact with hot parts, materials, or equipment such as furnaces)
- Fires and explosions
- Chemical exposures (gases or liquids released from pipelines)

Often power sources are inadvertently turned on, or valves opened mistakenly before the work is completed, resulting in serious injuries and fatalities. Therefore, it is important not only to ensure that all energies are properly locked out, but also that they remain locked out until the work is completed.

Preparation

1. Notify all affected workers that a lockout is required and the reason for the lockout.

Machine or Equipment Shutdown and Isolation

1. If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.). Only workers knowledgeable in the operation of the specific equipment should perform shutdown or re-start procedures.
2. Operate the energy-isolating device(s) so that all energy sources (electrical, mechanical, hydraulic, etc.) are disconnected or isolated from the equipment.
3. Electrical disconnect switches should never be pulled while under load, because of the possibility of arcing or even explosion.

4. Stored energy, such as that in capacitors, springs, elevated machine parts, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be released, disconnected, or restrained by methods such as grounding, repositioning, blocking or bleeding-down.
5. Pulling fuses is not a substitute for locking out. A pulled fuse is no guarantee the circuit is dead. Even if a circuit is dead, another person could inadvertently replace the fuse.
6. Equipment that operates intermittently, such as a pump, blower, fan or compressor may seem harmless when it is not running. Do not assume that because equipment is not operating at a particular point in time that it will remain off for the duration of any work to be performed on it.

Application of Lockout/Tagout

1. Lock out and tag the energy-isolating device with an assigned, individual lock. A worker will not be protected unless he/she uses his/her own padlock.
2. If more than one worker is working on the same piece of equipment at the same time, each one should lock out the equipment, by placing a personal lock and tag on the group lockout device when he/she begins work, and should remove those devices when he/she stops working on the machine or equipment.
3. Locks and tags should clearly show the name of the person who applied the device, the date, and the reason for the lockout. This identifies who is servicing the machinery or equipment. In a multiple lockout/tagout situation, it will also identify any worker(s) who may not have finished working.
4. Locks and tags must be durable enough to withstand the environment in which they are to be used. Information on the locks and tags should remain legible.
5. Locks must be substantial enough to prevent removal without the use of excessive force. Tags must be substantial enough to prevent accidental or inadvertent removal.
6. Both locks and tags are to be standardized by colour, shape, or size. Tags should be easily recognized and provide appropriate information about the lockout.
7. For some equipment it may be necessary to construct attachments to which locks can be applied. An example is a common hasp to cover an operating button. Tags must be attached to the energy isolating device(s) and to the normal operating control in such a manner as to prevent operation during the lockout.

Verification of Isolation

1. After ensuring that no workers can be injured, operate the push button or other normal controls to verify that all energy sources have been disconnected and the equipment will not operate.
2. If there is a possibility of re-accumulation of stored energy, such as an increase in pressure to a hazardous level, isolation of the equipment must be periodically verified until the maintenance or repair is completed, or until the possibility of such accumulation no longer exists.

3. Return operating controls to neutral position after the test. A check of system activation (e.g. use of voltmeter for electrical circuits) should be performed to ensure isolation.
4. The equipment is now locked out.

Lockout/Tagout Interruption

1. If a machine is locked/tagged and there is a need for testing or positioning of the equipment/process, the following steps should be followed:
    - Clear the equipment/process of tools and materials.
    - Ensure workers are a safe distance from any potential hazard.
    - Remove locks/tags according to established procedure.
    - Proceed with test.
    - De-energize all systems and re-lock/re-tag the controls before resuming work.

Release From Lockout/Tagout

1. Before locks and tags are removed and energy is restored to the machine or equipment, inspect the work area to ensure that non-essential items have been removed and that machine or equipment components are operationally intact.
2. Ensure workers are a safe distance from any potential hazard.
3. Each lock and tag should be removed from each energy-isolating device by the worker who applied the lock and tag.
4. Notify affected workers that locks and tags have been removed.

Lockout for Hydraulic Systems

1. Workers should always follow instructions in the operator's manual for servicing hydraulic systems. Where appropriate, a properly qualified and certified mechanic should perform repairs and maintenance.
2. Shut off the engine that powers the hydraulic pump.
3. Lower implement to the ground or onto a solid support.
4. Move the hydraulic lever back and forth several times to relieve pressure.
5. When applicable, blanking devices should be used.