Lockout – Tag Out

Course Outline

- Terminology
- When a Lockout - Tag Out is Used
- Lockout Devices
- Lockout procedure
- Removing a lock
- Zero Tolerance

Terminology: Lockout

- A lockout is one method of **controlling** hazardous energy. In practice, it is the isolation of energy from a particular system, machine, or piece of equipment.
- It means cutting **all sources of energy** and placing a **personal lock** at the source, to prevent the starting of this piece of machinery while it is being cleaned, maintained, adjusted or repaired.

Terminology: Lockout Device

- Any device that locks an energy-isolating device in the safe position.

Cord Cover	Lockout Hasp	Group Lockout Box	Wall Switch Lockout Device
			
Pneumatic Lockout Device	**Valve Lockout Devices**	**Breaker Lockout Devices**	
	 	 	

Terminology: Energy-Isolating Device

- A mechanical device that physically prevents the transmission or release of energy.

Terminology: Tag Out & Tag Out Device

- **Tag Out:** When a tag is placed on an energy-isolating device, under an established procedure, to indicate that the energy-isolating device and the equipment it controls cannot be operated until the tag out device is removed.
- **Tag Out Device:** A prominent warning sign that can be securely fastened to an energy isolating device.
- **Important** - This never replaces a lock!

Terminology (Energy)

- **Energized:** When a tool or piece of equipment / machinery is connected to an energy source or contains potential energy.

- **De-energized:** When a process has been used to disconnect and isolate a system from a source of energy in order to prevent the release of that energy.

- **Hazardous Energy:** Any type of energy existing at a level or quantity that could be harmful to workers or cause injury through inadvertent release or start-up of equipment.

Terminology: Zero Energy State

- The machine is incapable of spontaneous or unexpected action.
- There is no residual energy left in the machine.
- “An energy level that is not harmful to any individual.”

Terminology: Energy Sources / Types

- **Electrical energy**
  - power transmission lines, transformers,
  - circuit breakers
- **Hydraulic energy**
  - fluid under pressure (cylinders and lift trucks)
- **Pneumatic energy**
  - air under pressure (pipes, tanks, and vessels)

Terminology: Energy Sources / Types

- **Kinetic energy**
  - Kinetic = caused by motion
  - Examples: moving conveyor, flywheel, moving saw blade
- **Potential energy**
  - Potential = stored energy
  - Examples: spring, battery or elevated weight

Terminology: Energy Sources / Types

- **Mechanical energy**
  - the sum of kinetic and potential **energy** in an object that is used to do work
- **Gravitational energy**

  -the potential energy held by an object because of its high position compared to a lower position. In other words, it is energy associated with gravity or gravitational force

Requirements

Employers must:

- provide safety lock and key;
- establish written lock-out procedure; and
- adequately train employees.

Requirements

Employees must follow procedure when:

- they are required to place any part of their body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation); and / or
- an associated danger zone exists during any machine operating cycle.

When?

- Any time service or maintenance is performed on any machinery or equipment that includes:
  - testing
  - installing
  - setting up
  - adjusting
  - inspecting
  - repairing

Where?

- Locks and tags are applied to all primary and secondary energy sources:

  - electrical
  - hydraulic
  - pneumatic
  - mechanical
  - kinetic
  - chemical

Why?

To save workers from serious injuries or death!

Locks

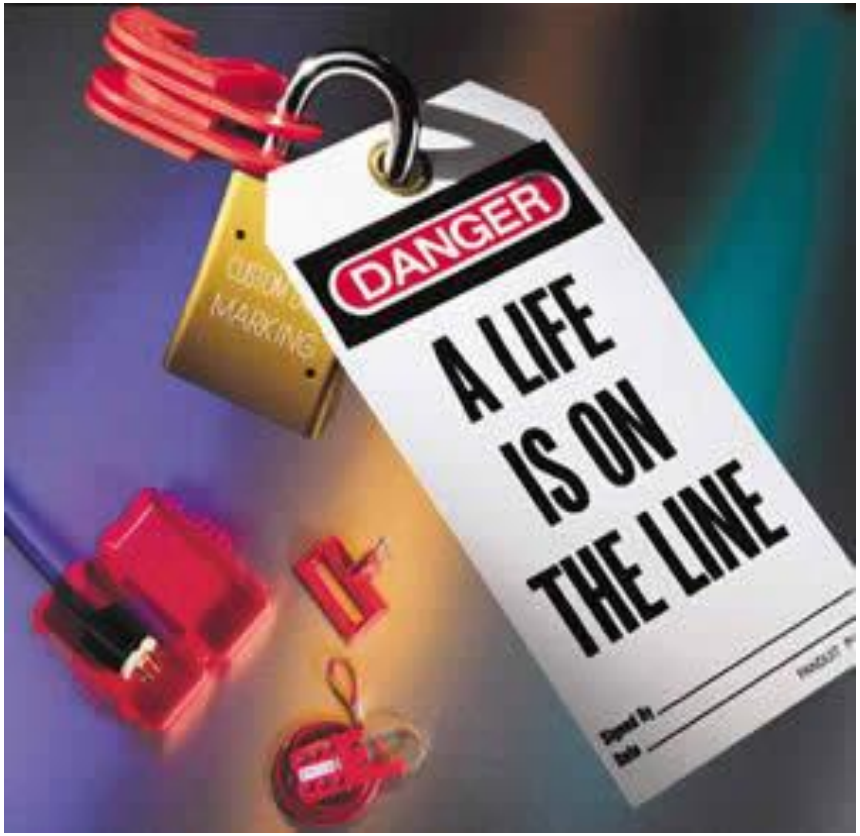
- Locks used for lockouts must be unique and easily identifiable.
- Each lock must be:
  - red,
  - labeled with specific identifying information;
  - capable of withstanding the environment to which exposed; and
  - substantial enough to prevent operation of the energy isolating device without excessive force, unusual measures, or destructive techniques.

Equipment

- Hasps – when more than one person has to work on locked out equipment, a multiple locking device must be used so each worker can secure their own lock
- Tags – extra protection which provides vital information; NEVER a substitute for a lock-out
- Covers – used for connectors and valves

Sample Hasps

Sample Tags



Sample Covers

Sample Lockout Box / Boards

Sample Lock Station

Process…

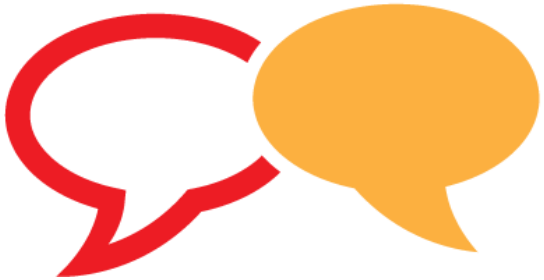
- Prior to beginning:
  - ensure you have required PPE; and
  - inform other workers in the area of your intent.

- Prepare for the shutdown of the system.

  Identify the following:
  - the type and magnitude of the energy to be controlled;
  - any hazards in the area, including stored energy; and
  - the method or means of controlling the energy as identified by the lockout placard.

Process…

- Communicate the shutdown of the system.



- Shut down the system following the specific shutdown procedures found on the lockout placard.

Process…

- Isolate the system by following established isolation procedures that specify the use of:
  - Disconnect switches,
  - Line valves,
  - Blocks,
  - Blanks,
  - Removal of spools, and
  - Capping of lines.

Remember:

- cut-off ***EVERY*** source of energy
  - ✓ valves, main disconnects, circuit breakers
- do not forget auxiliary power (electrical, secondary steam, hydraulic, pneumatic)
- do not forget secondary sources of energy (such as backup generators)

Pulling the fuse is NOT locking out!

Process…

- Apply lockout and tag out devices
  - ✓attach lock to each isolating device used to establish the isolation
  - ✓each employee working on the system MUST apply their own lock

Process…

- De-energize the system by releasing all potentially hazardous stored or residual energy.

  Energy must be:
  - relieved,
  - blocked,
  - bled,
  - restrained, or
  - rendered safe by an authorized individual involved in the work.

Process…

- ***Verify proper isolation of equipment by:***
  - Having an authorized employee attempt to restart the system OR performing a potential check of all electrical sources
  - Ensuring all controls are returned to the “off” or neutral” position after trying to start the system
    - do **NOT** take anything for granted; double-check your steps

TEST BEFORE YOU WORK – Do it yourself!
Don’t rely on someone else!

PERFORM WORK

- Perform all necessary work – keeping locks in place.

- Inspect the system to ensure it is returned to it's normal state by checking the following:

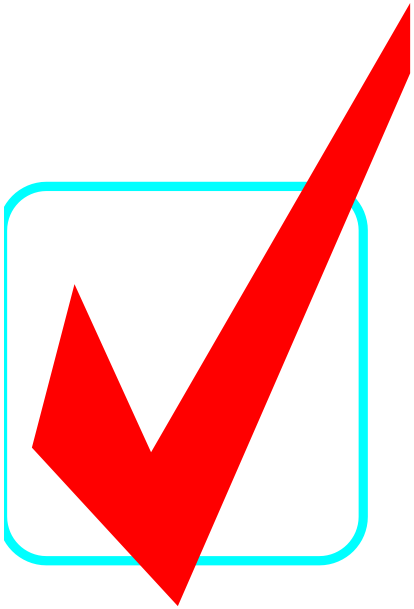
  - All temporary de-energization measures or devices have been terminated or removed;
  - The system is operationally intact;
  - All necessary guards have been removed; and
  - All tools used for any servicing or maintenance have been removed.

Release System from Lockout…

- Release the system by:
  - having an authorized employee ensure that ALL personnel are clear and have been told that the energy to the system will be restored;
  - removing locks / devices that have been used to isolate the system; and
  - restoring the energy.

Removing Locks and Tags

- ✓ Notify affected employees
- ✓Check and re-check



Famous Last Words...

- It will take longer to lock out than to do the repair...
- It will only take a minute...
- It’s lunch time, no one is around...
- The machine is stopped, it must be locked out...
- It’s OK to do it this way, right?!?

Questions