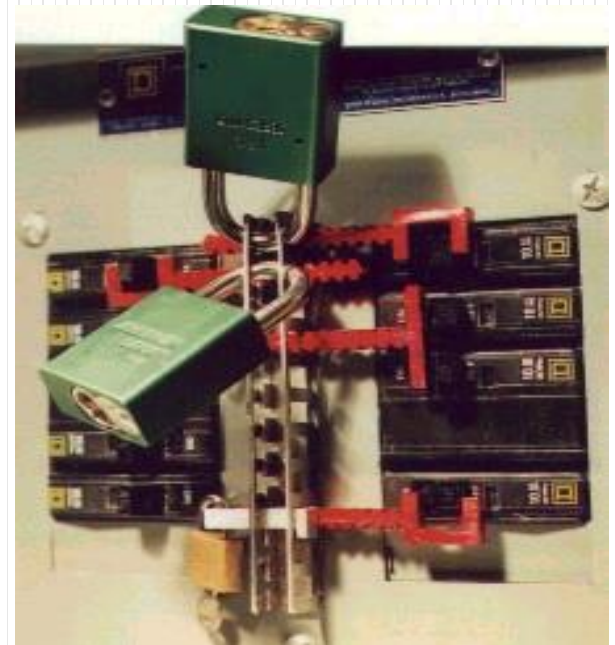


LOCKOUT - TAGOUT

**The Control of
Hazardous Energy**

OSHA Standard 1910.147



Learning Objectives

- Purpose of Lockout-Tagout
- Types of Hazardous Energy
- Requirements for LOTO
- Procedures for LOTO

Purpose of Lockout/Tagout?

- Required by law (OSHA)
- To protect people working near the machinery (affected employees)
- To protect YOU (authorized employee)

Types of Energy

Electrical Energy

Electric shock can kill

As low as 30 volts
can carry enough
current to kill



Use Safe Electrical Practices

- Use non-conducting tools
- Insure circuits are dead before working
- Lock & Tag “source” breakers not switches
- Insure power is de-energized

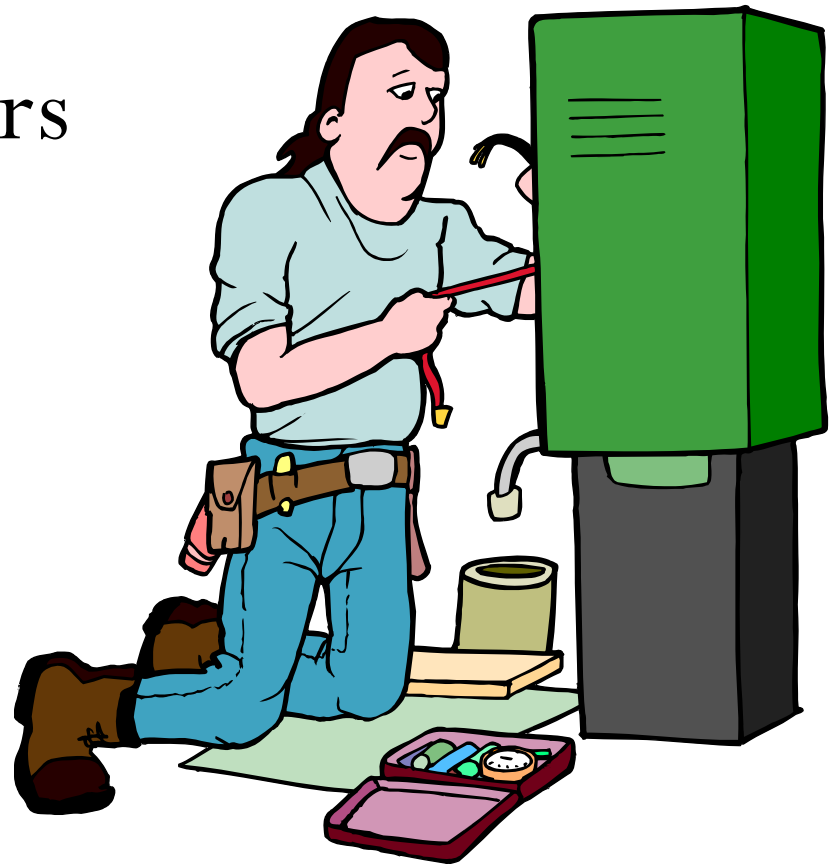
Mechanical Energy

Two Types

- Kinetic – in motion
- Potential - stored

Types of Kinetic Energy

- Flywheels
- Moving Conveyors
- Saws in Motion
- Fans in Motion



Types of Potential Energy

- Energy stored in machinery
- Weights & Springs
- Pistons under pressure
- Hydraulic controls

Mechanical Energy Hazards

- Amputations
- Lacerations
- Fractures
- Loss of life



Chemical Energy

Chemical Energy Hazards

- Start Fires
- Skin Burns
- Harmful Gases and Fumes

Before working – release, drain or vent chemicals safely

Thermal Energy

HOT & COLD

Thermal Energy Hazards

- Burns
- Frostbite
 - Quick release of compressed gases (LP)

Allow equipment to reach a safe temperature before starting work.

Hydraulic Energy

UNDER PRESSURE

Hydraulic Energy Hazards

- Rapid release of fluid
- Ejection of system parts
- Sudden movement of equipment

Relieve pressure slowly into a proper container

Pneumatic Energy

COMPRESSED GASES (AIR)

Pneumatic Energy Hazards

- Rapid release of gas
- Rapid De-pressurization
- Sudden movement of equipment

Properly vent/bleed all systems before starting work.

Lockout/Tagout Requirements

Knowledge

Know your equipment & systems

- hazards
- isolation points
- procedure for Lockout

WORKING ON UNFAMILIAR MACHINERY IS
A HAZARD **AND PROHIBITED BY EBAY.**
YOU MUST BE TRAINED BEFORE WORKING
ON EQUIPMENT.

Who Can Lockout Equipment?

Only Authorized Employees

Authorized Employees are those employees that are:

- trained on lockout procedures of that equipment
- authorized by management
- subject to periodic reviews by other authorized employees.

Items needed for LOTO

- Written LOTO schedule
- Written LOTO procedures
- Locks & Tags - identified to the worker
- Hasps - for placing locks & tags
- Breaker Clips - for electrical LOTO
- Blank Flanges (pancakes)- for fluid lines
- Valve Covers - for LOTO of Valves
- Plug Buckets - for electrical plugs

Energy Control Procedure

This procedure covers the servicing and maintenance of machines and equipment in which the "unexpected" energization or start up of the machines or equipment, or release of stored energy could cause injury to employees. The purpose of this procedure is to ensure machines are completely de-energized, and employees are fully protected during servicing or maintenance. The plant manager authorizes the use of these procedures. Our rules call for following all the requirements set forth in OSHA regulation 1910.147 for controlling hazardous energy, and using the techniques outlined in Appendix A of 1910.147. Employees not following these requirements will be subject to disciplinary procedures.

Machine Name: _____ **Location:** _____

Equipment Number: _____

Authorized Employee(s) _____

Affected Employee(s) _____

<u>Energy Source Type</u>	<u>Magnitude of Energy</u>	<u>Energy Hazard</u>	<u>Control Device</u>
_____	_____	_____	_____
_____	_____	_____	_____

1. Notify Affected Employee: Contact Department Supervisor to take machine off production schedule, and notify affected employee(s) machine will be locked out. _____

2. Machine Shutdown: Identify type and location of operator controls. _____

3. De-activation: Identify type and location of energy isolating devices. _____

4. Lock out: Apply locks to energy isolating devices.

5. Stored Energy: Identify location of stored energy source(s), and describe method(s) for dissipation or restraint. _____

6. Verify Energy Isolation: Try operator controls and return to 'OFF' position.

"Restoring Equipment to Service". When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

(1) Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

(2) Check the work area to ensure that all employees have been safely positioned or removed from the area.

(3) Verify that the controls are in neutral.

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Use of Locks & Tags

- Use only those issued to you
- Never use another workers lock or tag
- Ask your supervisor if you need more LOTO equipment

LOTO Devices

Must be:

- Singularly identical
- The only devices used for controlling energy
- Used for no other purposes

LOTO Devices

Must be

- Durable (*A*)
 - Withstand the environment
 - Not become illegible in wet or damp locations
 - Not deteriorate when exposed to corrosive environment

LOTO Devices

Must be

- Standardized (*B*)
- Substantial (*C*)
 - Lockout devices shall prevent removal
 - Tagout devices shall prevent inadvertant removal

LOTO Devices

Must be

- Identifiable (*D*)
 - By employee attaching devices

Lockout/Tagout Procedures

7 Step LOTO Procedure

- Prepare for Shutdown
- Shutdown Equipment
- Isolate all energy sources
- Place Locks & Tags
- Release Stored Energy
- Verify Equipment Isolation
- Lockout/Tagout Release

1. Prepare for Shutdown

- Understand equipment hazards
- Notify other workers of shutdown
- Have machine specific procedure available

2. Shutdown Equipment

- Use normal shutdown procedure
- Turn all switches to OFF
- Shut all control valves
- Disable all sources of energy

*BE AWARE OF MULTIPLE ENERGY SOURCES

3. Isolate All Energy Sources

- Shut valves
- Open breakers & disconnects

*BE AWARE OF MULTIPLE ENERGY SOURCES

4. Place Locks & Tags on

- Valves
- Breakers / electrical disconnects
- Block or disconnect all lines
- Lock and tag blank flanges

*BE AWARE OF MULTIPLE ENERGY SOURCES

5. Release/Block Stored Energy

- Block or release springs
- Block elevated parts
- Stop rotating flywheels
- Relieve system pressure
- Drain fluids
- Vent gases
- Allow system to cool

6. Verify Equipment Isolation

- Check all other workers are clear
- Check locking devices (securely placed ?)
- Check isolation
- Attempt normal startup
- Return Controls to OFF/Neutral

7. Release from LOTO

- Insure machine guards are in place
- Put tools away
- Inform others of startup
- Restore system connections
- Remove Locks & Tags
- Conduct normal startup

Contractors

All contractors must have an approved LOTO procedure or follow our procedures

Lock and Tag Removal

Only the employee who placed the tag.

If they are not present, follow the “non-standard removal” policy.

Non Standard Removal

May remove a lock IF:

- Verified that the employee is not in the building
- Make all reasonable efforts to contact the employee
- Insure that the employee has knowledge of LOTO removal before they resume work at the facility

Group Lockout

All employees working on a piece of equipment must have their lock on the group lockout box

Retraining

Retraining required when change in:

- Job assignments
- Machinery
- Energy control procedure

Retraining

- Additional Retraining when periodic inspection reveals need

Periodic Inspections

Periodic Inspections are required:

- Annually for all machine specific procedures used in the past year
- Annually for all authorized employees

Summary

- Know the energy present at your facility
- Know the lockout/tagout requirements
- Know the procedures
- Follow the procedures