CLARIFY PROGRAM REQUIREMENTS
DEFINE EMPLOYEE ROLES
DISCUSS CONCERNS
HOW INJURIES OCCUR DURING SERVICING

WHAT IS LOTO?
• TYPES OF HAZARDOUS ENERGY
• WHEN TO APPLY LOTO
• ENERGY ISOLATION DEVICES

LOTO BASICS

GENERAL LOTO PROCEDURES

SPECIAL SITUATIONS

EXERCISE
HOW INJURIES OCCUR

80% FAILED TO TURN OFF EQUIPMENT
10% ACTIVATED BY SOMEONE ELSE
5% FAILED TO CONTROL POTENTIAL ENERGY
5% DUE MOSTLY TO FAILURE TO VERIFY POWER DISCONNECTED
WHAT IS LOTO?

LOCKOUT / TAG OUT [“LOTO”]

TECHNIQUE USED TO PREVENT ENERGY FROM BEING RELEASED DURING WORK ON EQUIPMENT

LOCKS PLACED ON ENERGY ISOLATION DEVICES PRIOR TO STARTING WORK
## TYPES OF HAZARDOUS ENERGY

- ELECTRICAL
- STEAM
- THERMAL [BOTH HOT AND COLD]
- MECHANICAL
- THERMAL
- PNEUMATIC
- HYDRAULIC
- CHEMICAL
- RADIATION
- LASER
- MAGNETIC FIELD
- SPRINGS UNDER TENSION
- SUSPENDED EQUIPMENT

TURN OFF, DISSIPATE, OR OTHERWISE CONTROL
LOTO AND ZES

GOAL OF LOTO IS

“ZERO ENERGY STATE”
POTENTIAL ENERGY - STORED ENERGY WAITING TO BE RELEASED (BALL IN HAND)

KINETIC ENERGY - ENERGY BEING RELEASED (BALL FALLING)

ZERO ENERGY STATE WOULD BE BALL LYING ON LEVEL GROUND
POTENTIAL ENERGY CAN BE
CONVERTED TO KINETIC ENERGY

(AND INJURE YOU IN THE PROCESS !)
LOTO IS APPLIED DURING SERVICING EQUIPMENT

- Adjusting
- Inspecting
- Modifying
- Replacing parts
- Tool changes
- Clearing jams
- Lubricating
- Cleaning
EXCEPTION

NORMAL PRODUCTION PROVIDING FOLLOWING CONDITIONS ARE MET

- ROUTINE, REPETITIVE, INTEGRAL WORK
- GUARDS AND SAFETY DEVICES IN PLACE
- BODY PARTS NOT PLACED IN DANGER DURING MACHINE CYCLE
- ALTERNATIVE PROTECTION MEASURES ARE TAKEN
EXCEPTION

CORD AND PLUG EQUIPMENT IF ...

• PLUG IS ONLY SOURCE OF ENERGY
• PLUG UNDER CONTINUOUS CONTROL OF ONE PERSON
LOTO PLACES LOCKS ON ENERGY ISOLATION DEVICES

Physically prevents the transmission or release of energy

Examples

- Electrical Disconnect
- Breaker switches
- Hydraulic valves
- Pneumatic valves
- Line valves

Push buttons, selector switches and other unlockable circuit controls are **not** energy isolation devices.
LOTO BASICS FOR EMPLOYEES

- **AUTHORIZED EMPLOYEE** – SERVICES EQUIPMENT AND APPLIES LOTO
- **GROUP LOTO** - EACH AUTHORIZED EMPLOYEE APPLIES HIS OR HER OWN LOCK/TAG TO EACH ISOLATION POINT
- **AFFECTED EMPLOYEE** – OPERATES OR USES EQUIPMENT BEING SERVICED
- **OTHER EMPLOYEES** – WORK IN AREA WHERE LOTO IS BEING APPLIED
LOCKOUT IN CONJUNCTION WITH TAG OUT IS PREFERRED METHOD FOR ENERGY CONTROL

EACH ISOLATION POINT HAS BOTH LOCK AND TAG ATTACHED
LOCKS MUST BE STANDARDIZED AND USED ONLY FOR LOTO
TAGS MUST INCLUDE

• **SIGNATURE** OF LOCK HOLDER

• **DATE** OF APPLICATION
STEP 1
ID ENERGY SOURCES

STEP 2
NOTIFY OTHERS

STEP 3
SHUTDOWN EQUIPMENT

STEP 4
ISOLATE EQUIPMENT

STEP 5
LOTO EQUIPMENT

STEP 6
RELEASE STORED ENERGY

STEP 7
VERIFY ISOLATION

STEP 8
PERFORM SERVICING

STEP 9
RELEASE FROM LOTO
STEP 1
IDENTIFY ENERGY SOURCES

- TYPE AND MAGNITUDE
- CONSIDER ALL ENERGY SOURCES
- DON’T FORGET POTENTIAL ENERGY
- IF IN DOUBT, CLARIFY
- GATHER ALL CONTROL DEVICES
STEP 2

NOTIFY OTHERS

• ALL “AFFECTED” AND “OTHER” EMPLOYEES

• NOT ALL EQUIPMENT WILL HAVE SOMEONE SPECIFICALLY ASSIGNED
STEP 3
SHUT DOWN EQUIPMENT

- USE NORMAL STOPPING PROCEDURES FOR SHUTTING DOWN EQUIPMENT
- PUSH STOP BUTTON; OPEN TOGGLE SWITCH, ETC.
STEP 4
ISOLATE EQUIPMENT

• ISOLATION IS **NOT** THE SAME AS SHUTDOWN

• DISCONNECT EQUIPMENT FROM ALL ENERGY SOURCES

• TURN ELECTRICAL DISCONNECT TO “OFF” POSITION; OPEN CIRCUIT; CLOSE VALVES, ETC.
STEP 5
LOTO EQUIPMENT

• ATTACH LOCKS AND DEVICES TO EACH ISOLATION POINT
• TAG MUST ACCOMPANY EACH LOCK
• ALSO TAG POINT OF OPERATION IF REMOTE LOTO POINT
STEP 6
RELEASE STORED ENERGY

- BLOCK ELEVATED PARTS
- BLOCK OR RELEASE SPRINGS
- RELIEVE SYSTEM PRESSURE
- DRAIN FLUIDS
- VENT GASES
- ALLOW SYSTEM TO COOL
- DISCHARGE CAPACITORS
- STOP ROTATING FLY WHEELS
STEP 7
VERIFY ISOLATION

STEP MOST FREQUENTLY SKIPPED

• PERFORM BEFORE WORK BEGINS
• USE NORMAL STARTING PROCEDURES
• RETURN CONTROLS TO “OFF”
• DO NOT “ASSUME”; DO NOT SKIP THIS
STEP 8
PERFORM SERVICING

• COMPLETE REQUIRED WORK

• AVOID ACTIVITIES THAT COULD REACTIVATE EQUIPMENT

OK TO INTERRUPT LOTO, BUT MUST BE REAPPLIED IF SERVICE IS TO CONTINUE
STEP 9
LOTO RELEASE

- All locks/tags must be removed by same person who applied them
- Remove all tools from equipment area
- Replace all machine guards
- Inform all “affected” and “other” employees
- Clear area before restart
Special Situations

Servicing lasts longer than one shift.

Worker who applied lock is not available.

Contractors are performing service or maintenance at your workplace.

Oncoming shift applies locks/tags prior to outgoing shift removal.
Supervisor must be notified if lock owner is not available.
Contractors must have approved lockout of their own.
DANGER

A LIFE IS ON THE LINE