Basics for Lock out

"Imagine yourself performing maintenance inside of a machine and suddenly, the machine springs to life, powerful metal gears grinding around you, placing you in huge danger. Did you positively locked out all energy sources before working on this machine?"

- That's why you need a lockout procedure or Isolation Work Instruction(IWI) to disable equipment to protect you from either an unexpected release of energy or an accidental start-up while performing a job! By energy we mean all forms of energy: Chemical, Electrical, Hydraulic, Mechanical, Pneumatic, Potential, Thermal, Radiation, Kinetic/Stored, Hazardous substances,…..etc.

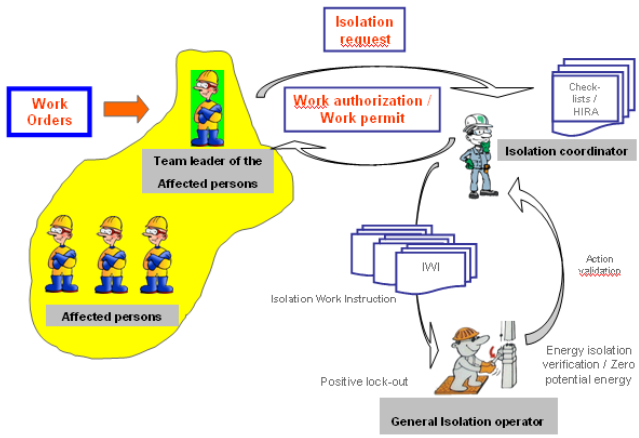
  - When do we need to isolate equipments?
    - when an employee must either remove or bypass machine guards or other safety devices
    - when an employee is required to place any part of his or her body in contact with the point of operation of the equipment;
    - or is required to place any part of his or her body into a danger zone associated with a machines' operating cycle.

- Lockout procedure or IWI is a written document describing a set of predetermined steps that has to be followed to keep an installation and/or equipment and its components from being energized or being set in motion or to prevent the release of stored energy, and avoid the release of hazardous substances in order to protect the safety of employees during services and/or maintenance and/or total productive maintenance tasks and/or tasks in degraded situations and/or inspections, which take place during normal production operations.

- Isolation Work Instruction (IWI) ; describes how an installation for a specific job must be isolated from his energy sources. Includes; task description, identification of the equipment and the isolation points, which isolation method, verification process, date, author ….etc.

- Positive Lockout is the placement of a lockout device, a lock, which physically blocks an energy isolation device linked to a primary power source and which is identifiable with a label.

  - Who are the involved employees in the lockout procedure;
    - Affected employee; member of the work execution team whose requires him/her to operate under isolation
    - Individual Isolation operator; only locks out energy sources for his own safety ('own isolation') and is declared competent to do so on selective equipment
    - General Isolation operator (GIO, authorized person); locks out machines or equipment in order to perform servicing or maintenance on that machine or equipment by others. One familiar with the equipment and hazards involved who possesses the skills and techniques necessary to execute a safe. He is the one who puts his locks the first on and the last off on the isolation points. He must be declared competent.
    - Isolation coordinator; coordinates and checks follow-up activities between all parties during safety execution phase, mostly during maintenance days. Isolation coordinator normally doesn't perform the lock out



Basics for Lock out

What are the possible predetermined steps for positive isolation (more than one person is involved)?

Request for isolation

- Identify all energy sources and other hazards, perform a risk assessment and select the isolation practice (HIRA)
- Identify all isolation points linked to the energy sources
  - The general isolation operator (GIO) will locate and identify isolating devices (or verify the IWI, if available) to be certain which switch's, valve's, or other energy isolating devices apply to the equipment to be locked out. More than one energy source (electrical, mechanical or others) may be involved. He shall know the type and magnitude of energy that machine or equipment utilizes and shall understand the hazards.

Preparation for shutdown

Machine or equipment shutdown

- If the machine or equipment is operating, shut it down using normal stopping procedures (depress stop button, open toggle switch, close valve, etc.).

Isolate all energy sources

- Operate the switch, valve or other energy-isolating devices so that the equipment is isolated from its energy source.

De–energize all stored energies

- Stored energy (such as that in springs, elevated machine member, rotating fly wheels, hydraulic systems, air, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.

Applying lockout devices

Locking

- Lock out the energy-isolating devices with assigned individual locks or department locks.
- That locks and identification labels must be marked with names or pictures identifying them with the GIO (authorized person) placing them and other people may not remove locks or identification labels of another owner. Individual lock and the key must to be kept by the owner and the key is unique!
- If more than one individual is required to lockout equipment, each shall place his or her own personal lockout device on the energy isolating device (s). When an energy-isolating device cannot accept multiple locks, a multiple lockout device (hasp) or lock box may be used.


- Identification Labels are essentially warning devices affixed to energy isolating devices and should be clearly legible, recognizable, durable and contain a legend such as the following:

- DO NOT START, DO NOT OPEN, DO NOT ENERGIZE -

Verification of isolation/ de-energizing

- After ensuring personnel are not exposed or at risk, ensure that the energy source is disconnected, and then operate the control device to ensure that the equipment is completely reenergized/inoperable. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists. CAUTION: Return operating controls to "neutral" or "off' position after verifying the isolation of the equipment.
- The process of operating the start controls, engaging levers, measuring voltage, inspecting lockout devices; valves, disconnect switches, blades, piping systems to make sure that all energy sources have been isolated and controlled. Make a start-up test after making sure no one is exposed to check the performed isolation.

! THE EQUIPMENT IS NOW LOCKED OUT !

Perform the task

Re-energizing

- After the equipment is fixed, serviced or maintenance completed and equipment is ready for normal operations, the GIO shall check to ensure everyone is clear of the machine or equipment.
- When all tools are removed, guards reinstalled and all employees are clear, the GIO should remove the lockout devices. After checking to ensure all operating controls are in the "neutral" or "off' position power should be restored to the machine.

Return control to operations

- When it is verified all functions are operating properly, the GIO shall return the lockout devices to normal operation.

Record date/time lockout removed and system restored

Consider these questions during auditing

- Do affected employees understand the purpose of lockout?
- Have responsible persons (GIO) been nominated and trained to perform isolation?
- Are all energy sources consudered during the assessment for isolation?
- Is an energy-isolating device, a mechanical device like a valve or a circuit breaker which controlles the main energy source?
- Are all equipment control valve handles provided with a means for locking-out?
- Is stored engery considered into the isolation work instructions, be released and blocked?
- Before removing a machine guard must the equipment be locked out?
- Is lockout performed when a worker puts a part of his/her body into an operating or dangerous zone of an equipment?
- May only tags been used for positive lockout?
- Are locks foreseen with labels which warn e.g. : “ to not operate equipment”?
- May affected employees help an authorized person by fastening his lock to a disconnect switch?
- Are locks in use which are specifically identified for lockout?
- Are appropriate employees provided with individually keyed personal safety locks?
- Can the performer of an isolation be traced at all time?
- Is there a means provided to identify any or all employees who are working on locked-out equipment by their locks and accompanying identification label?
- Are verifications performed before the equipment is declaired locked out?
- Is it required that employees check the safety of the lock-out by attempting a startup after makingsure no one is exposed?
- Are the lock-out documents recorded?

This listed points are the minimum to be checked during an audit.