056: Lockout/Tagout Energy Sources

Discussion leader duties for this session:

Bring several items used for LOTO including locks, multi-lock hasp, tags and assorted locking devices for circuit breakers, switches, cords, and other devices.

What this Safety Talk covers:

The highlights of identifying energy sources that could cause personal injury if not properly isolated.

Discussion notes :

Energy sources

It is easy to overlook an energy source. Not all energy sources are obvious. Use proper lockout/tagout procedures required by regulatory agencies, your company, and the facility at which you are working. Failure to follow these procedures may result in loss of wages, employment or life.

Electricity is not the only energy source you must account for. Do not limit your investigation to the electrical side of the house.

Other energy sources that can cause personal injury: mechanical (springs), hydraulic (fluids under pressure), pneumatic (air systems), chemical, and thermal.

The failure to properly lockout and tag equipment may result in debilitating injuries. It may cause you or others to lose hearing, sight, limbs, or life.

Pre-work

Review the scope of work with your foreman.

Walk the system you will be working on. Look for all potential energy sources you may come in contact with in the course of the task you are preparing to do.

When you identify an energy source, determine the best method of isolating it. You can often isolate an energy source without having to lock it out, or you may need to lockout other sources to isolate that one. For example, if you are removing a bolted pressure switch, you can release the spring pressure by opening the switch and not charging the closing springs. Failure to release spring pressure (both opening and closing springs) may result in switch operation or cycling, and that can mean injuries to fingers or other body parts. Remember to isolate and lock out energy sources that may feed the switch.

Review the lockout/tagout procedures required by the facility at which you are working. These may differ from your own procedures, or require additional steps such as detailed interaction with operations people. Resolve any discrepancies with your foreman. Many facilities have specific LOTO procedures in place for every piece of equipment.

Look for automated controls that could re-enable energy sources. For example, you must lockout both sources of a dual fed electrical bus.

Determine how control devices will respond when power is removed. For example, electrically-operated valves may fail open, fail closed or maintain their position. Their failure mode is independent of their actuation because valves use two different means. For example, a valve that requires energy to open may also fail open upon loss of power. Be aware of how this affects the process so you don't create a hazard for others or the environment.

Be aware of residual stored energy in a system even after it has been isolated. The stored electrical energy in capacitors has killed many people, even though the associated electrical equipment was properly locked.

Be aware how changes in the ambient environment can affect energy devices. For example, changes in barometric pressure and temperature can create a pressure differential across a closed pressure vessel.

Review and Discussion

What are some energy sources you may need to account for?

Is it a problem if you miss one energy source out of many when doing your lockout/tagout prework? Why or why not?

What are some energy sources that may not require a lock to isolate?

Why is it important to review the operation of any automated control system associated with equipment you are working on?

Why should you review the lockout/tagout procedures of the facility where you are working, if your company already has its own lockout/tagout procedures?

Give an example of residual stored energy.

How should you verify energy sources are isolated?

What task should you complete before removing locks and re-energizing the system? What if you aren't able to do this task yourself?

What are some concerns about starting a system after lockout/tagout?

Why is it important to walk your locks?

Verification

Ensure automated controls have been disabled. Remove power sources to charging motors, actuators and other controlling devices as required to fully isolate the energy source. Verify against the drawings and confirm with actual measurements.

Verify that energy sources are isolated. Use a meter to check for voltage, use pressure gauges and thermometers to verify no hydraulic or thermal energy and use your eyes to inspect everything.

Walk your locks before returning to work if you have left the work area, even for a few minutes.

Restoration

Inspect your work before restoring energy sources. Have a qualified employee review the work before removing locks and re-energizing energy sources.

You may need to follow detailed start-up procedures when re-energizing a system after lockout/tagout. If you do not know how to start it up, don't try. Ask your foreman to provide help from a qualified employee who is knowledgeable in the operation of the equipment and its overall system.

Participant's Signature and Date