Avoiding Accidents Through Lockout/Tagout

Controlling risk through following lockout/tagout (LOTO) procedures is critical any time you're dealing with equipment or machines powered by electricity, steam, hydraulics, gas, compressed air or a combination of sources.

An example of the importance of following lockout/tagout procedures is a scenario where a welder is directed by a supervisor to remove a jammed piece of metal from the hydraulic door of a scrap metal shredder. As he'd done several times before, the man grabbed his ladder, torch and padlock and went to the hopper. While lying across the top edge of the door, he cut away the obstruction with the torch. Once he succeeded, the hydraulic door – which was still under pressure – closed upward on the man. This tragic accident caused the man to be crushed to death because he had neglected to use the padlock to secure the system.

The lockout/tagout OSHA Standard (29CFR1910.147) mandates criteria for de-energizing equipment during servicing and maintenance operations in order to prevent unexpected energization or start-up. Lockout refers to literally installing a lock (keyed or combination) on an energy-isolating device. Tagout refers to placing tags or labels on those devices to warn others not to restore energy to them.

To avoid an incident, never assume someone else has completed the task of LOTO. You are responsible for your own safety. If you need to weld any energized equipment or machines, you should follow these step-by-step procedures:

1. Locate and identify isolating devices to confirm switch(s), valve(s) or other energy isolating devices for equipment lockout/tagout.
2. Notify all affected employees that lockout/tagout is going to occur. (Authorized employee(s) must know the machine type, its energy magnitude and the hazards.)
3. Shut down equipment/machine with normal stopping procedures.
4. Isolate equipment/machine from the energy source(s) by locking or tagging out with assigned individual lock(s) or tag(s). It is imperative that only the worker completing the work have control over the key.
5. Bleed or release all potentially hazardous stored or residual energy, including trapped air, gas and chemicals. Safely dissipate/restrain stored energy (such as that in springs, hydraulic systems, etc.) by repositioning, blocking, bleeding, etc.
6. Verify equipment/machine isolation prior to service or maintenance work.
7. Service equipment/machinery with a "buddy," wearing proper personal protective equipment (PPE) – insulated gloves, sleeves, insulated tools and protective helmet.

Before lockout or tagout devices are removed and energy is restored, authorized employee(s) must perform the following:

1. Inspect the work area to ensure non-essential items have been removed and that machine or equipment components are intact and capable of operating properly.
2. Check the area around the machine or equipment to ensure all employees have been safely positioned or removed.
3. Notify affected employees immediately after removing locks or tags and before starting equipment or machines.

4. Ensure locks or tags are removed only by those authorized employees.

Additional safety tasks are required for special circumstances, such as testing or repositioning equipment during service. Situations involving on-site contractors, multiple shifts or new personnel also may require special LOTO procedures.

In cases like these, OSHA allows the temporary removal of locks or tags and the re-energization of the machine or equipment only when necessary. When this occurs, the re-energization must be conducted in accordance with the following sequence of steps:

1. Clear the machines or equipment of tools and materials.
2. Remove employees from the immediate area.
3. Remove the lockout/tagout devices as specified in your company plan.
4. Energize and proceed with testing or positioning.
5. De-energize all systems, isolate the machine or equipment from the energy source, and reapply lockout or tagout devices as specified.

If a machine cannot be locked out, it must be tagged out with a tag that cannot be easily removed or cut away. Clearly, tags affixed to energy-isolating devices do not provide the physical restraint of locks – but they can still prevent injury. All tags should be legible and understandable, and must be made of materials that can withstand the environmental conditions found in your workplace. They should be attached using fasteners that cannot be removed easily. And once a tag is applied, it should be removed only by the qualified person who applied it.

Employees who perform or are affected by LOTO procedures must receive training at least annually. According to OSHA regulations, “Employees must understand the purpose, function and restrictions of the energy control program and that authorized employees possess the knowledge and skills necessary for the safe application, use and removal of energy controls.”