



Lockout Tagout Plan

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It goes without saying that industrial equipment can be dangerous when it's being used. That's why machines are designed with safety equipment and operators wear personal protective equipment when using them.

But machinery can also present hazards when it's not in operation. As long as energy sources such as electricity, natural gas, steam, pressurized water, and compressed air are attached to the machine, a hazard exists. Workers who maintain or repair the equipment, or who will be working in close proximity to it, need to be made aware of these hazards and recognize that steps have been taken to protect them.

That's why OSHA requires a formal lockout/tagout program. While it may seem that having a formal program with multiple steps may be overkill, it actually makes good sense. After all, most companies use a variety of equipment that has very different safety practices. In addition, any number of workers may be asked to deal with the equipment, and some will be more familiar with it than others.

Just as airline pilots with thousands of hours in the cockpit still go through step-by-step checklists before even the shortest flight – even though they could probably perform the actions in their sleep – having a detailed lockout/tagout program is one of the best ways to ensure that nobody gets injured and no machinery gets damaged.

When developing a lockout/tagout program, I like to imagine that it's Christmas night, and a contractor has been called in to perform an emergency shutoff of some complex machine. He's never seen the machine before, and he can't reach anyone from the company. By creating sound, detailed, clear guidelines, I can prepare him for what he might encounter, so he'll be able to work safely.

An effective lockout/tagout program should include the following eight steps.

Step 1: Detailed procedures for equipment

Begin by making sure you've identified the equipment correctly and accurately, including its specific location. Next, determine the correct procedure for shutting down and restarting the equipment. Detail that procedure, step by step, in writing. Consider all of the energy sources that may be connected to the equipment. Be very specific, because ambiguous language could lead to an incorrect or even dangerous action.

Step 2: Notify affected employees

When maintenance is going to be performed, all of the employees that may be affected should be notified. Let them know the timing of the work, and how long the equipment may be unavailable. If the unavailability of the equipment requires a change in work processes, be sure they are familiar with the steps to be taken.

Step 3: Shut down equipment properly

Explain the shutdown process in detail. It's not enough to say something like "disconnect the machine." To ensure everyone's safety and reduce the potential for damage, the shutdown instructions should be detailed. Spell out the exact actions to be taken and the correct sequence for performing those actions.

Step 4: Disconnect all primary energy sources

Although this may seem fairly self-explanatory, once again, it's important to be very detailed. Whether the primary

energy sources include electricity, steam, water, gas, compressed air, or others, don't assume that the person performing maintenance will know the correct procedure to follow. Again, explain exactly what needs to be done.

Step 5: Address all secondary sources

While disconnecting the primary energy sources may remove much of the potential danger, it's possible that there sources of residual energy, such as trapped heat in a thermal system, fumes that may need to be vented, or even tension in a spring assembly. Identify the process that will relieve any remaining pressure or other energy. Also consider other hazards, such as moving equipment that must be secured before work begins.

Step 6: Verify the lockout

Once you've disconnected all primary and secondary sources of energy, attempt to start the equipment to verify that the lockout has been successful. Before you try to start it, verify that nobody is in a position where they could be hurt. Assuming that the procedures have been successful, return all switches and other equipment back to their "off" positions so the machine won't start unexpectedly when the energy sources are reconnected. Once you've verified the lockout, attach a lockout or tagout device to the equipment to ensure that it cannot be started without removing the device. These are kept in a labeled cabinet near the kitchen and bathrooms at Generator.



Step 7: Keep it in force during shift changes

The equipment must remain in lockout/tagout condition across shift changes, so that workers arriving at the site are aware that the equipment is out of service. If individual locks or tags are used, the individual responsible for designating the lockout/tagout and the individual responsible for it during the next shift must both be present as the locks or tags are switched.

Step 8: Bring the equipment back on line

When the work is done and all tools and other materials have been removed, the machine can be brought back into operation. Here again, the procedure should spell out the exact steps that are involved, along with the correct sequence. For example, you may need to open a particular machine's discharge valves before you open the inlet, so any unexpected water or steam remaining in the lines has a place to go.

Bonus step: Keep procedures up-to-date

Equipment and operating procedures tend to change over time, and your lockout/tagout program needs to reflect those changes. Sometimes, the changes may be so minor that only the people working directly with the equipment are aware of them. That's why it's a good idea to review all your lockout/tagout procedures regularly to verify that they're still accurate. A company with just a small number of machines may be able to check all of them every year, while a larger organization may need to study a certain number or a random sample every year. Another benefit of regular review is that it gives you an opportunity to deploy newer and better ideas or more accurate descriptions.