

Lockout/Blockout

Failure to *lockout* and/or *blockout* machinery before working on it is a major cause of serious injury and death. Workers are electrocuted or lose fingers, hands and arms, or suffer severe crushing injuries because machinery is inadvertently turned on while it is being maintained, repaired or adjusted. These injuries can be prevented by establishment and use of an effective *lockout/blockout* program.

Anyone who operates, adjusts, unjams, lubricates, repairs or works on a machine should be familiar with lockout and blockout procedures to prevent serious injury to himself or to fellow workers. Hazards exist anytime protective guards are removed, equipment is put into unusual positions, moving machinery is adjusted, or during similar operations. Employers should establish lockout and blockout procedures particular to their operation and machinery, and ensure that employees are trained in those procedures.

In a recent Bureau of Labor Statistics study on injuries related to servicing equipment, 80% of the workers surveyed failed to even turn off the equipment before performing the service work. There is a difference between turning off a machine and actually disengaging or de-energizing a piece of equipment. When you turn off a control switch, you are opening a circuit. There is still electrical energy at the switch, and a short in the switch or someone inadvertently turning on the machine may start the machine running again.

Statistics show that of the 20% of the workers who did turn off the machinery, about half of them were injured when someone else accidentally reactivated the

machinery. Many times the person who reactivated the machinery was a co-worker who was unaware that the machine was being serviced. And a fifth of those workers who turned off the control switch were injured by the energy still in a machine that should have been blocked. The moving parts of the machine either continued to coast, or the parts moved when the jam was cleared up. A recent accident illustrates this problem. A table saw was turned off, but the saw blade was still coasting and had not come to a complete stop. An employee began cleaning the machine, and his finger was amputated by the blade.

Other accidents have occurred when the control switch on a machine was turned off, but a short in the switch restarted the machine. Accidents have also occurred even when workers did take the necessary steps of disconnecting the main power source, but they did not test the equipment to make sure that the machinery was, in fact, de-energized. In one case, the lockout had been done on the wrong power line. And in another case, a second power line had been spliced into the wiring beyond the point of the lockout.

Locking out and blocking out are the only sure ways to prevent accidental start-up of machinery or equipment. Lockout/blockout means that any energy source, whether it is electrical, hydraulic, mechanical, compressed air, or any other source that might cause unexpected movement, must be disengaged or blocked, and electrical sources must be de-energized and locked, or positively sealed in the off position. Lockout and blockout are two essential safe work practices to use when working with machinery.

Lockout/blockout procedures include:

- A written energy control program which includes detailed procedures for identifying and controlling hazardous energy sources during all phases of the lockout/blockout process, from preparation for shutdown through removal of the lockout/blockout device.

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- Design and installation of lockout device capabilities on any machines or equipment receiving major repairs, renovation, modification or replacement. If possible, hazardous energy sources should be physically locked or blocked.

LOCKOUT PROCEDURES

LOCKOUT the main power source in the off position to prevent unexpected or inadvertent movement of the machine. This prevents the machine from being started accidentally. It also allows repairs or adjustments to be made safely to the motor and its connections. *Lockout control circuits only when it is impossible or impractical to lockout the main power source.*

USE A CHAIN AND PADLOCK TO LOCKOUT VALVES that do not have a built-in lockout mechanism. This will prevent the valve from being inadvertently moved by someone.

MAKE ALL LOCKOUTS WITH A PADLOCK, SEAL, TAG OR OTHER POSITIVE METHOD to ensure that power cannot be turned back on accidentally. If other lockouts are already in place, add yours for your own protection.

TEST THE CONTROL, SWITCH OR VALVE after you have made the lockout on it so that you are sure that it cannot be operated. Also check the machine or equipment if you are not sure it has been de-energized.

ATTACH A SIGN OR TAG to inform others that you have locked out a machine. The sign should state:

- The reason for the lockout,
- Your name and how you may be contacted, and when the tag was put in place.

The tagout devices shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds.

Conduct inspection of energy control procedures at least annually.

Train authorized employees in the specific procedures which constitute the energy control program. Instruct all other employees about the procedures and prohibitions to restarting or re-energizing locked out and tagged out equipment. The new OSHA standard does not make allowance for tagout of old equipment which cannot be physically locked or blocked. However, the employer must demonstrate that such tagouts provide a safety factor equivalent to lockout/blockout.

BLOCKOUT PROCEDURES

PHYSICALLY BLOCKOUT air operated, gear driven or hydraulically operated units of the machine or equipment. (Note: Use “jog” buttons or “constant pressure” buttons to control machinery in cases where you must watch the machine run, or make repairs or adjustments while it is moving.)

BLEED DOWN steam, air or hydraulic cylinders.

BLOCKOUT gears, dies and other mechanisms to prevent movement. Put blocks under raised dies, lifts or any equipment that might descent, slide, fall or roll.

RELEASE coiled springs, spring loaded devices and securing cams.

USE BLOCKS OR SPECIAL STANDS under raised vehicles, machines or equipment to prevent failure or slippage of the jacks or elevating device. Place blocks (chocks) under wheels of parked vehicles or equipment to prevent movement.

Remember that nothing is fail safe, particularly when it comes to relying on people to work safely day after day. It is only human nature to forget or make a mistake occasionally. This is why lockout and blockout procedures are critical in preventing serious injury and death.

For further information or assistance, contact your Zenith Safety & Health Consultant.

Zenith provides workplace safety resources at: **TheZenith.com** RM119CON v1.1 (9/09) 2