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The Control of Hazardous Energy (Lockout/Tagout)



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I. Purpose

This procedure addresses the servicing and maintenance of machines and equipment, including piping systems, in which the unexpected energization or start up of the machine or equipment or release of stored energy could cause injury to employees (see different types of energy listed in table below). It establishes the requirements to ensure that equipment or electrical/mechanical systems are isolated from all potentially hazardous energy, and are locked out or tagged out before employees perform any service or maintenance activities. This written energy control program describes this school district's compliance with WAC 296-803.

This procedure applies when an employee is required to remove or bypass a guard, or an employee is required to place any part of his/her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed or where an associated danger zone exists during a machine operating cycle.

Forms of hazardous energy

Potential	Stored energy that can be drawn upon to do work. Suspended loads, compressed springs, and pressurized hydraulic systems are examples. Potential energy can be converted to kinetic energy and many of the other energy forms below.
Kinetic	Energy resulting from moving objects such as released loads and uncoiling springs. When these objects are released, their potential energy is converted to kinetic energy.
Flammable	Energy converted from the combustion of gasses, liquids, solid chemicals, and vapors.
Chemical	The capacity of a substance to do work or produce heat through a change in its composition. Chemical energy can be converted from gasses, liquids, solid chemicals, and vapors.
Electrical	Energy generated through the conversion of other forms such as mechanical, thermal, or chemical energy. Energy stored between plates of a charged capacitor is an example of potential electrical energy. Typical electrical energy sources include open busbars, motors, and generators.
Thermal	Energy transferred from one body to another as the result of a difference in temperature. Heat flows from the hotter to the cooler body. Sources include mechanical work, radiation, chemical reactions, and electrical resistance.

It does not apply to work on cord and plug-connected equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and with the plug being

under the exclusive control of the employee performing the servicing or maintenance.

II. Definitions

Affected Employee: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee: A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this part.

Energy Isolating Device: A mechanical device that physically prevents the transmission or release of energy, including (but not limited to) the following: a manually operated electrical circuit breaker, a disconnect switch, a line valve, or a block. (Note: Push buttons, selector switches and other control circuit devices are not energy isolating devices.)

Energy Source: Any source of electrical, mechanical, chemical, hydraulic (pressurized liquid), pneumatic (pressurized gas or air), chemical, thermal (heat or cold) or other energy, including gravity.

Lockout: The placement of a lockout device on an energy isolating device so that the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device: A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevents the energizing of a machine or equipment.

Point of Control Device: Any electrical or mechanical device, such as a switch or valve that regulates or stops the flow of energy between a machine or system and its energy source.

Residual Energy: Latent (left over) energy that remains in a machine or system after it has been shut down, such as a turning blade or shaft, electricity in a capacitor, or trapped pressure that could unexpectedly release hazardous material or operate a moving part during the work.

Tagout: The placement of a tagout device to an energy isolating device to indicate that the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device: A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Zero Energy State: The state of a machine or system in which residual energy in any form has been dissipated to a safe level, and lockouts have been installed and verified.

III. Employee Training and Responsibility

All maintenance, custodial, and transportation employees who perform service or maintenance activities, or work in or around machines or systems which require such service or maintenance will be instructed in the purpose of the energy control program and the use of the lockout or tagout procedures at the beginning of their employment and periodically as needed. This training will be documented.

Other employees will be trained in this program to the extent that they will know not to remove any lockout or tagout device, and not attempt to operate any switch, valve, or other energy isolating device when it is locked or tagged out.

Authorized employees will be trained in:

- The purpose and function of the energy control program
- The type and magnitude of energy available in the workplace
- Recognizing hazardous energy sources
- Methods and means to isolate and control energy

Each affected employee will be instructed in:

- The purpose and use of the energy control procedures
- The prohibition against attempting to restart or reenergize a machine or equipment that is locked or tagged out

Employees are also trained in the following:

- Tags are warning devices and do not provide the same level of physical restraint as a lock.
- When attached to energy-isolating devices, tags are not to be removed without the approval of the authorized person responsible for it or by-passed, ignored, or otherwise defeated.
- Tags need to be legible and understandable to be effective.
- Tags may evoke a false sense of security.
- The meaning of tags needs to be understood as part of the overall energy control program.
- Tags and their means of attachment must be securely attached to energy-isolating devices so they cannot be inadvertently or accidentally detached. They must be

made of materials that will withstand the environmental conditions they will be exposed to.

Employees will be retrained as necessary to introduce new or revised control methods and procedures when there is a change in any of the following:

- Job assignments
- Machines, equipment, or processes that present a new hazard
- Energy control procedures

Employees will be retrained to reestablish proficiency when:

- A periodic inspection show the employee deviates from, or has inadequate knowledge of, the energy control procedures or,
- The employer has reason to believe retraining is necessary.

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout or tagout. The authorized employees (those so trained) are required to perform the lockout or tagout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked or tagged out, shall not attempt to start, energize or use that machine or equipment. Violations of this procedure are safety violations subject to disciplinary action as outlined in school district policy.

IV. Energy Control Procedures

Following is a list of some of the equipment that may require lockout or tagout during servicing or maintenance:

- * Prescott School District employees are not allowed to work on any multi hazardous energy source equipment.
- * Motorized vehicles
- * Motorized heavy equipment, including: lawn tractors, forklifts, backhoes
- * Boilers and hot water tanks
- * HVAC equipment, including hood exhaust systems
- * Hard-wired electrical lights
- * Air compressors and tanks
- * Electrically-controlled overhead rolling doors
- * Pumps
- * Hard-wired industrial arts and shop equipment
- * Lift equipment, including: hydraulic presses and jacks
- * Kitchen equipment: hard-wired steam tables, deep fat fryers, grills, dishwashers, freezers and coolers

If an energy isolating device is capable of being locked out, the lockout procedure below shall be utilized. If an energy isolating device is not capable of being locked

out, tagout may be used. Using tagout requires additional staff training addressing tagout procedures and more frequent program inspections.

A. Lockout Procedures

Lockout involves the placement of a lockout device (a designated padlock) on an energy isolating device (such as a switch, lever, or valve handle in an "off" position) so that the equipment being controlled cannot be operated until the lockout device is removed.

1. Sequence of lockout

- a. The authorized employee must identify the type and magnitude of the energy that the machine or equipment utilizes, understand the hazards of the energy to be controlled, know the methods or means to control the energy, and know all point of control devices.
- b. Notify all affected personnel (those in the immediate area and/or users of the equipment) that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.
- c. Shut down the machine or equipment (if operating) using normal stopping procedure (depress stop button, open switch, close valve, etc.)
- d. Deactivate and lockout the energy isolating device(s) with assigned individual specially-designated lock(s). If more than one individual is required to repair or maintain a machine or equipment each person will place his/her own personal lockout device on the point of control device. When a point of control device cannot accept a multiple lock, a multiple lockout device (ASP) may be used.
- e. Dissipate or restrain stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) by methods such as grounding, repositioning, blocking, bleeding down, etc.
- f. Verify that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, and then verify the isolation of the equipment by operating the push button or other normal operating control(s), or by testing to make certain the equipment will not operate.

CAUTION: Return operating control(s) to neutral or “off” position after verifying the isolation of the equipment.

g. The machine or equipment is now locked out.

2. **Restoring equipment to service**

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- a. Restore all safety guards.
 - b. Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed, and that the machine or equipment components are operationally intact.
 - c. Tell co-workers that you are removing the lockout or tagout device. Check the work area to ensure that all personnel have been safely positioned or removed from the area.
 - d. Verify that the controls are in a neutral or off position.
 - e. Remove the lockout devices and reenergize the machine or equipment. Make sure only the authorized employee who applied the lockout device removes it.*
 - f. Notify the affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.
- * The employer may have the lockout or tagout device removed by someone other than the authorized employee who applied it under certain circumstances. These exemptions are found in WAC 296-803-50035.

3. **To Temporarily Energize Equipment**

If it is necessary to temporarily energize a machine, equipment, or component for testing or positioning you can remove the device, the following steps must be taken:

- a. Clear tools or other materials near the equipment.
- b. Make sure no workers are near the equipment.
- c. Remove the lockout or tagout devices.
- d. Energize the equipment

- e. After completion of work, shut down the equipment, reapply the lockout or tagout device using normal procedures.

B. Tagout Procedures

Tagout is the placement of a tagout device (a prominent warning device, such as a tag and a means of attachment) to an energy isolating device (such as a switch, lever, or valve handle in an "off" position) to indicate that the equipment being controlled may not be operated until the tagout device is removed. Tagout is to be used only when the energy isolating devices are not lockable.

The tagout device must be placed so it clearly shows that moving the energy-isolating device from the "safe" or "off" position is prohibited. The tagout device should be fastened in a position at the same point a lock would have been attached. If it cannot be attached to the energy-isolating device, it must be attached as close as possible to the energy-isolating device and immediately obvious to anyone attempting to operate the energy-isolating device.

The procedures for tagout are the same as for lockout (see IV. A. 1 & 2 above), except the designated tagout device (a substantial, specially designated warning tag) is used instead of a lock. The tag, placed on the point of control, will list the machine or equipment, date, and time it was tagged out, the signature(s) of all personnel assigned to the work, and the reason for the tagout. Tags are not to be removed without the approval of the authorized person responsible for it. In addition, employees using tagout need to bear in mind that **tags are warning devices only**, and do not provide the physical restraint that locks do.

V. Contractors and Outside Service or Maintenance Workers

Each outside contractor whose work requires service or maintenance of school district machinery or equipment which, if started or energized unexpectedly could cause injury, will be required to follow the school district's lockout/tagout procedures. The contractor will be informed of these procedures by the agency employee contracting for the work (maintenance, custodian, or the building administrator).

Contractors who may be in the area of school district service or maintenance activities will be made aware of the lockout/tagout procedures by the authorized employee doing the work.

VI. Group Lockout/Tagout

Employees working in a group must be given the same level of protection as that provided by an individual lockout or tagout device. Each authorized employee must place their personal lockout or tagout device on the group lockout device before

beginning work. Each employee is not to remove the device until they have finished work on the machine or equipment. A primary authorized employee who has overall responsibility for the service or maintenance should attach their personal lockout or tagout device to the energy-isolating device when the equipment is deenergized and before any work begins and should be the last person to remove their lockout or tagout device when the job is completed.

VII. Periodic Inspection

1. The Safety Officer and the Facilities /Maintenance Manager will monitor the effectiveness of these procedures to make sure employees know how to and can apply the energy control procedures and to correct any deviations or inadequacies identified. This will be accomplished by:
 - a. Unscheduled observation of employee activities to confirm conformance with the procedures.
 - b. Observation, or discussion with new employees to confirm proper training has been given.
 - c. Periodic discussions with personnel regarding the use of these procedures.

If the review covers a procedure for lockout devices, the reviewing employee will review the responsibilities with each authorized employee (individually or in a group) who uses the procedure.

If the review includes tagout devices, the reviewing employee will review with each affected and authorized the employee's responsibilities and the limitations of tagout devices.

2. These reviews will be documented. Documentation will include the identification of the machine or equipment on which these procedures were being utilized, the date of review, the employees included in the review, and the person performing the review.
3. If the review finds that employees are not following energy-control procedures or that the procedure is not effectively protecting them, then these employees must be retrained or the procedure changed so that it is effective.
4. Effectiveness of the procedures will be conducted at least annually.