

NOTICE!

The following procedure is currently under revision.

If you need to refer to this procedure and have questions regarding applicability, please contact the Safety Office at 425.388.3549.

CONTROL OF HAZARDOUS ENERGY **(LOCKOUT/TAGOUT)**

I. SCOPE

- A. The procedure for Control of Hazardous Energy (Lockout/Tagout) helps safeguard employees while they perform **servicing and maintenance** on machines and equipment in which the unexpected energization or startup of the machine, or equipment, or the release of stored energy could occur and cause injury or possible death.
- B. This procedure establishes **minimum** performance requirements for control of hazardous energy and applies to any source of mechanical, electrical, hydraulic, pneumatic, gas, fluid, chemical, thermal or potential energy, including gravity.
- C. This procedure applies to the control of energy during:
 - 1. Servicing and/or maintenance of machines and equipment.
 - 2. Work performed on piping systems.
 - 3. Servicing of motor vehicles or heavy mobile equipment.
- D. Normal production activities, such as minor tool changes, adjustments and lubrication that are routine and repetitive are not covered by this procedure **unless:**
 - 1. An employee is required to bypass a guard, interlock or other safety device; or
 - 2. Workers are required to place any part of their bodies into an area of the machine or equipment where work is actually performed upon material (point of operations) or where an associated danger zone exists during the machine or equipment operating cycle. Cleaning, un-jamming and major tool changes, adjustments and lubrication could cause that exposure.
- E. This procedure does not apply to:
 - 1. Installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication or metering.

2. Exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations, which is covered by WAC 296-24-956 through WAC 296-24-985.
3. Work on cord and plug connected electric equipment when 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 by the plug being under the exclusive control of the employee performing the servicing or maintenance.

NOTE: The plug is considered under the exclusive control of the employee if it is physically in their possession, or in arm's reach and in the line of sight of the employee or if a lockout/tagout device is on the plug.

4. Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, provided that the department demonstrates that:
 - a. Continuity of service is essential; and
 - b. Shutdown of the system is impractical; and
 - c. Documented procedures are followed, and special equipment is used which will provide proven effective protection for employees; and
 - d. The employees involved are specifically trained and qualified on the equipment and procedures to be used.

II. DEFINITIONS

- A. Affected employee - An employee whose job requires them to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout/tagout, or whose job requires them to work in an area in which servicing or maintenance is being performed.
- B. Authorized employee - An employee who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.

NOTE: An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance as described in this procedure.

- C. Capable of being locked out - An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability.
- D. Energized - Connected to an energy source or containing residual or stored energy. Any electrical equipment not locked or tagged out will be considered energized.
- E. 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 manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. A push button, selector switch, remote control switches automatic circuit activating devices and other control circuit type devices, are not energy isolating devices.
- F. Energy source - Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy, including gravity.
- G. Hot tap - A procedure used in the repair, maintenance, and services activities which involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or apparatus. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.
- H. Lockout - The placement of a lockout device on an energy isolating device, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
- I. 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. Other types of devices include bank flanges and slip binds.
- J. Normal production operation - The utilization of a machine or equipment to perform its intended production function.

- K. Energy control procedure - A procedure for a machine or equipment that an authorized employee must use to ensure proper lockout/tagout methods are followed.
- L. Servicing and/or maintenance - Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start up of the equipment or release of hazardous energy.
- M. Setting up - Any work performed to prepare a machine or equipment to perform its normal production operation.
- N. Tagout - The placement of a tagout device on an energy isolating device, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
- O. Tagout device - Warning tags and means of attachment that can be securely fastened to an energy-isolating device.

III. PURPOSE

- A. This procedure identifies the practices authorized employees will use to shutdown and lockout/tagout machines, equipment and circuits for protection from accidental or inadvertent operation. Affected personnel must be notified prior to a lockout/tagout operation. Machines or equipment must be stopped and de-energized, isolated from all potentially hazardous energy sources and locked out/tagged out. Isolations and de-energization is then verified before servicing or maintenance is performed.
- B. **LOCKOUT** has been determined by the Department of Labor and Industries to be the best way to ensure machines, equipment, systems and circuits cannot be started or unexpectedly energized by someone not authorized to do so. Employees shall use lockout *instead* of tagout in every situation where it is physically possible to install locks or locking devices.
- C. Only ***authorized*** employees may lockout or tagout machines, equipment or circuits. Only personnel who have been properly trained in lockout/tagout procedures can be authorized users of lockout/tagout devices. Helpers or trainees will work under an ***authorized*** employee's lock and tag and under

their direct supervision to ensure helpers or trainees understand what is to be done and safety precautions that are to be taken.

- D. If an energy-isolating device is not lockable, then tagout may be used. When tagout is used, attempt additional safety measures equivalent to using lockout. This might include removal of an isolating circuit element, blocking a controlling switch, opening an extra disconnecting device, or removing a valve handle.

E. LOCKS

1. All authorized employees shall have their own lock, whether combination or key type, designated by a red color.
2. No employee may use another's lock or tag.
3. No employee may remove another's lock or tag.

EXCEPTION:

An authorized employee's supervisor may have the employee's lock or tag removed in an emergency situation, provided that written verification is made by the supervisor that:

- a. The employee is not at the facility.
- b. All reasonable efforts have been made to contact the authorized employee to inform them that their lockout/tagout device has been removed.
- c. The removal of the lockout/tagout device is essential prior to the return of the authorized employee.
- d. An inspection has been completed by another authorized employee that as best as can be determined the unavailable persons work is safe for energizing or starting the machinery or equipment.
- e. Copies of this verification will be sent to the County Safety Office, the Department Head, and the authorized employee.

F. TAGS

1. Tags must accompany all lockout operations, except one tag will suffice for a group lockout.
2. Tags must meet the following criteria:

- a. Red or red and white for danger tags.
- b. Yellow for caution tags.
- c. Must indicate authorized employees name and phone number.
- d. Must be constructed so that exposure to weather conditions, wet or damp location, or corrosive environments will not cause the tag to deteriorate or allow the message on the tag to become illegible.
- e. Tag attachment means shall be of non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds.

NOTE: The preferred tag attachment means is a one-piece, all environment-tolerant nylon cable tie.

IV. RESPONSIBILITIES

- A. Snohomish County is responsible for ensuring an effective, written energy control program is established, consisting of energy control procedures, employee training and periodic inspections to ensure compliance with lockout/tagout requirements.
- B. The County Safety Office is responsible for:
 1. Establishing the written control of hazardous energy procedure.
 2. Coordinating training of authorized and affected employees.
 3. Coordinating with departments for periodic inspections of the department's energy control procedures.
- C. Department Heads/Elected Officials in departments where authorized employees work, must ensure first line supervisors and managers are familiar with this procedure.
- D. Managers must ensure that energy control procedures are developed for all equipment and machinery under their control, as per section V.
- E. First line supervisors are responsible for implementing energy control procedures within their areas of responsibility as follows:
 1. All maintenance, repair or operation crews will initiate and maintain a lockout/tagout log to provide for personnel and equipment safety.

2. The lockout/tagout log will contain an entry for each time a lockout or tagout is made, along with a record of which locks are assigned to each worker.
3. The authorized employee is responsible for locking out and tagging equipment as described in this procedure. If there are any questions about the procedure or there is any difficulty locking out the controls, the employee shall call their supervisor before doing anything else. They must not guess or take a chance.

G. Authorized employees must follow these general guidelines:

1. Review the energy control procedure for the equipment or machinery to be worked on.
2. Perform proper lockout/tagout procedures, by de-energizing all energy sources.
3. Test the machine to make sure the lockout/tagout is effective.
4. Never loan their lock or key.
5. Remove only their own lock or tag.
6. Check with their supervisor, if there are any questions.

H. Department Head/Manager must ensure that when planning major replacement, repair, renovation, or modification of existing machines, equipment or circuits, energy isolating devices must be designed to accept a lockout device.

V. **ENERGY CONTROL PROCEDURES**

- A. Departments involved in the servicing or maintenance of machinery or equipment, including piping systems and the servicing of motor vehicles or heavy mobile equipment, must develop, document, and utilize procedures for the control of potentially hazardous energy.
- B. The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including but not limited to the following;
1. A specific statement of the intended use of the procedure;
 2. Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy;
 3. Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them; and

4. Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout device, and other energy control measures.
- C. Procedures need not be documented for a machine or equipment when **all** of the following elements exist:
1. The machine or equipment has no potential for stored or residual energy or accumulation of stored energy after shut down which could endanger employees;
 2. The machine or equipment has a single energy source that can be readily identified and isolated;
 3. The isolation and locking out of that energy source will completely de-energize and de-activate the machine or equipment;
 4. The machine or equipment is isolated for that energy source and locked out during servicing or maintenance;
 5. A single lockout device will achieve a locked-out condition;
 6. The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
 7. The servicing or maintenance does not create hazards for other employees;
 8. The employer in utilizing this exception has had no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.
- D. Procedures must include steps similar to the following:
1. Preparation for shutdown - The **authorized** employee must know the types and magnitude of energy that the machine or equipment uses and understand the hazards thereof. Notify all **affected** employees that a lockout or tagout project is going to be initiated and the reason why.
 2. Shut down - Should the machine or equipment be operating/energized, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.)
 3. Isolation - Operate the switch, valve, or other energy isolating devices so that the equipment is isolated from its energy source(s). Control circuit devices, such as push buttons, selector switches and interlocks, **shall not** be used as the sole means for de-energizing equipment or circuits.
 4. Release of Stored Energy - Stored energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam or water pressure, etc.) must be disconnected, dissipated, relieved, restrained (i.e., rendered safe) by

methods such as grounding, repositioning, securing, blocking, bleeding down or venting, etc. If there is a possibility of accumulation of stored energy to a hazardous level, continuous monitoring shall be performed while a potential hazard exists.

5. Lockout - Personally lockout and tag the energy isolating devices with assigned individual lock/tag. If lockout devices cannot be used then tags may be used.
6. Verification of isolation - After ensuring that no personnel are exposed, and as a check on having isolated the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.

CAUTION: Return operating controls to "neutral" or "off" positions after the test. Equipment is now locked out or tagged out. For work on electrical circuits, also verify de-energized condition by having a qualified person use test equipment to ensure circuit elements and equipment parts are de-energized, include tests for induced voltage or feedback from another source.

7. In the preceding steps, if more than one individual is required to lockout or tagout equipment, each person shall place their own personal lock (or tag) on the energy isolating device(s). When an energy isolating device cannot accept more than one lock or tag, a multiple lockout (e.g. gang lock, lockout clamp, tong or scissors) or tagout device may be used.
8. After the servicing and/or maintenance is complete and equipment is ready for normal operations, the **authorized** employee shall perform/verify performance of the following steps.
 - a. Inspect the area around the machine or equipment to ensure that non-essential items have been removed and that machine or equipment components are intact and capable of operating properly. Ensure that all personnel have been safely positioned or removed.
 - b. After all tools, materials, electrical jumpers, grounds, shorts, etc. have been removed from the machine or equipment, safeguards have been reinstalled and personnel are in the clear, remove all lockout or tagout devices. Notify **affected** personnel immediately after removing locks or tags and before starting equipment or machines.
9. If repositioning or testing is required before maintenance or servicing is complete, follow Section 8 to remove the lockout/tagout, perform the required repositioning or testing, then restore the lockout/tagout before continuing work.

E. Group Lockout/Tagout

1. If more than one crew, department, etc. is involved, one *authorized* employee will have primary responsibility to coordinate the lockout/tagout to ensure that all control measures are applied and that there is continuity of protection for the group. The procedure will be reviewed with each group member.

NOTE: Each employee has the right to individually verify that hazardous energy has been isolated and/or de-energized. Each *authorized* employee will affix their own lock and/or tag to the energy isolating device or group lockout device. The primary *authorized* employee removes their lockout or tagout device only after all members of the group complete working on the equipment and have removed their personal locks and tags.

F. Shift Changes

1. Shift changes will be coordinated by the *authorized* employee in charge of the group or individual lockout or tagout. If possible, the oncoming *authorized* employee shall lock out the energy-isolating device prior to the off going *authorized* employee removing his/her lock or tag.
2. After locks or tags are changed, the oncoming *authorized* employee shall verify the de-energized state of equipment or machinery.
3. If not possible to coordinate the shift change as above:
 - a. The lockout/tagout shall remain to the next working day, or
 - b. If it is known work will continue sometime during the night shifts (or weekend) take normal precautions and perform necessary notifications, then remove locks only, leaving a tagout in effect. Enter this information in the Lockout Log. This also applies if equipment will be idle waiting for repair materials or parts.

G. Contractors

1. Outside personnel or contractors involved in operations relating to equipment or machinery lockout or tagout that affects County employees, must review their energy control procedures with the responsible supervisor(s) for the affected area(s). The supervisor(s) must ensure contractor personnel understand and comply with restrictions and prohibitions of this procedure. Problems that cannot be resolved must be referred to the County Safety Office.

H. Energized Equipment

1. Only a **qualified** person may work on electrical and electronic circuits, parts, or equipment that have not been de-energized and this will only be allowed for **necessary** trouble shooting and testing. Such persons will be capable of working safely on energized circuits and shall be completely familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials and insulated tools.
2. This section applies to trouble shooting of exposed live parts (involving either direct contact or contact by means of tools or materials) or working near enough to them for employees to be exposed to any hazard they present. Troubleshooting should only involve the measurement of circuit parameters, visual inspection of readily accessible components, tightening of connections, and/or manual operation of contractors and switches. Any repairs necessary as a result of this troubleshooting will require the circuit be de-energized.
3. If de-energizing is unfeasible due to operation limitations, the supervisor may authorize work on energized equipment.
4. For repair/maintenance work on energized circuits, power insulation breakers, switches, etc., must be caution tagged. To better facilitate securing in an emergency, the two-man rule must be adhered to, and **supervisors'** permission must be obtained.
5. The appropriate **division manager** must be aware of the actions of his supervisor with regard to work on live circuits and should provide written guidelines to supervisors within the framework of this and all applicable regulations and instructions.
6. Under no circumstances should covers, guards, shields, frames, etc. be left off of equipment or machinery unless the equipment or machinery is locked out or tagged out, or if the equipment is energized, an authorized person must be actively working on the equipment.

VI. PERIODIC INSPECTIONS

- A. Periodic inspections should be conducted at least annually to ensure energy control procedures are documented and followed.
- B. These inspections must be performed by an authorized employee other than the one utilizing the energy control procedure being inspected.
- C. These inspections must be documented and maintained on file indefinitely.

VII. TRAINING

- A. The supervisor will coordinate initial lockout/tagout training for authorized and affected employees.
- B. Supervisor will notify the County Safety Office when initial training is conducted.
- C. Supervisors will determine when retraining is necessary for authorized or affected personnel under their cognizance and coordinate the retraining with the County Safety Office to ensure the training is documented.