

**LOCKOUT/TAGOUT WRITTEN PROGRAM**  
**CONTROL OF HAZARDOUS ENERGY, CFR 1910.147**

Community Colleges of Spokane  
Updated July 2001

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# LOCKOUT/TAGOUT PROGRAM

## Community Colleges of Spokane

### **PURPOSE:**

The lockout/tagout program of the Community Colleges of Spokane is initiated, per CFR Section 1910.147, to establish and implement procedures to prevent injury to employees through unexpected energizing of electrical circuits, movement of parts, or start-up or release of stored energy, fluids or gases during maintenance and repair activities. Means of accomplishment is by affixing appropriate lockout devices and/or tagout devices to energy isolating devices and to otherwise disable machines or equipment

### **BACKGROUND:**

Failure to lock out and/or block out 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. Prevention of these injuries can be achieved through use of an effective lockout program.

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 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 workers who did turn off the machinery, about half of them were injured when someone (generally a co-worker who was unaware that the machine was being serviced) accidentally reactivated the machinery. A fifth of those workers who turned off the control switch were injured by the energy still in the machine, which should have been blocked. The moving parts of the machine either continued to coast, or the parts moved when the jam-up was cleared.

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 failed to perform a crucial step for a complete lockout procedure. 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. This program has been developed to prevent these kinds of lockout/blockout accidents.

It is anticipated that nationwide implementation of proper lockout/tagout procedures will prevent nearly 120 fatalities, 28,400 lost workday injuries and 31,900 non-lost workday injuries a year.

### **APPLICATION:**

These procedures apply to the control of energy during servicing, repair, adjustment, and/or maintenance of machines and equipment and apply to employees who clean, install, lubricate, adjust, maintain or work with machinery and those who supervise staff who perform such functions. Examples of equipment and jobs requiring lockouts are:

- Cleaning or oiling movable parts of production machinery.
- Clearing blocked or jammed mechanisms.

-Making repairs on electrical circuits.

-Cleaning, adjusting or repairing the interiors of drums, tanks, etc. which revolve or contain movable parts.

### **EXCEPTIONS:**

This program does not apply to the following:

- A) Work on cord and plug connected electric 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 by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- B) 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 employer demonstrates that (1) continuity of service is essential; (2) shutdown of the system is impractical; and (3) documented procedures are followed and special equipment is used which will provide proven effective protection for employees.
- C) Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this program if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection.

Servicing and/or maintenance which takes place during normal production operations is covered by this program only if:

- A) an employee is required to remove or bypass a guard or other safety device; or
- B) an employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

NOTE: Equipment design and performance limitations may dictate that alternative, effective worker protection must be provided when the use of the established lockout procedure is not feasible. If machinery must be capable of movement in order to perform a maintenance task, such as a cleaning operation, workers can use extension tools (e.g., extended swabs, brushes, or scrapers) to protect themselves from injury.

### **DEFINITIONS:**

- 1) 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 and/or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.
- 2) Authorized employee: A person who locks or implements a tagout system procedure on machines or equipment to perform the servicing or maintenance on that machine or equipment. An authorized employee and an affected employee may be the same person when the affected employee's duties also include performing maintenance or service on a machine or equipment, which must be locked, or a tagout system implemented.
- 3) Bleed: To release stored hydraulic or pneumatic energy.

Blockout: Blocking out of potential energy, such as that stored in springs or which can come from suspended parts, to prevent inadvertent movement.

- 5) "Capable of being locked out": An energy isolating device will be considered to be capable of being locked out either if it is designed with a hasp or other attachment or integral part to which, or through which, a lock can be affixed, or if it has a locking mechanism built into it. Other energy isolating devices will also be considered to be 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.
- 6) Energized: Connected to an energy source or containing residual or stored energy.
- 7) 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 slide gate; a slip blind; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch, and other control circuit type devices.
- 8) Energy source: Any source of electrical, mechanical, hydraulic (oils and fluids), pneumatic (gases and air), chemical, thermal, or other energy.
- 9) 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 appurtenances. 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.
- 10) Key Interlock Systems: Bolt-lock and key sets that are available with bolt types and bolt projection lengths to suit a variety of applications. They include basic locks; multiple locks, which provide a number of cylinders for one interlock; detachable locks, which prevent access to fuses unless they are isolated from the power source; master locks, which accept their own key as well as master keys.
- 11) Lockout: The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
- 12) Lockout device: A mechanism or arrangement, which uses a key or combination lock to hold switches or valves in the "OFF" POSITION.  
(See next page for examples.)
- 13) Lockout switches: These switches provide an extra measure of safety when used with lockout/tagout or key interlock devices; however, they cannot be used alone to achieve lockout. A lockout switch at a motor location, such as a three-pole, double lockout switch, breaks connections to both the contactor coil and stop-button circuit. With this type of lockout switch, the motor cannot start, even if a short circuit occurs. Switches with two power-indicator lights are recommended. The second light eliminates the chance of getting a false power reading from a single, burned-out light.
- 14) Lockout system: A lock and hasp system that, when installed, makes it physically impossible to activate a switch, circuit breaker or any energy on/off point, whether it be electric, mechanical, hydraulic, pneumatic, nuclear or thermal.

- 15) Normal production operations: The utilization of a machine or equipment to perform its intended production function.
- 16) 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 unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.
- 17) Setting up: Any work performed to prepare a machine or equipment to perform its normal production operation.
- 18) Tagout: The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
- 19) 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 an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.
- 20) Zero mechanical and energy state: A state in which all sources of electrical, mechanical, hydraulic, pneumatic, thermal, and chemical energy are isolated or neutralized. This may include release of fluid or gas pressure, release of spring tension, blocking or lowering of suspended parts, etc.

#### **LOCKOUT vs. TAGOUT:**

Lockout shall be used, as prescribed, whenever an energy-isolating device is capable of being locked out (unless it can be demonstrated that the utilization of a tagout system will provide full employee protection).

If an energy-isolating device is not capable of being locked out, a tagout system is to be utilized.

When a tagout device is used on an energy-isolating device, which is capable of being locked out, the tagout device must be attached at the same location that the lockout device would have been attached, and the employer must demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

This demonstration of equivalency must include demonstrating full compliance with all tagout-related provisions of the CFR Section 1910-147 standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection will include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

#### **REPLACEMENT, REPAIR, RENOVATION, MODIFICATION OF NEW EQUIPMENT:**

Whenever major replacement, repair, renovation or modification of machines or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device.

## **TRAINING:**

Training shall be provided to ensure that the purpose and function of the energy control program are understood by employees affected by this standard and that the knowledge and skills required for the safe application, usage, and removal of energy controls are understood by these employees. This training will include the following elements:

- 1) Each authorized employee will receive training in recognition of zero energy and mechanical states and adequate methods to achieve these states.
- 2) Each authorized employee will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
- 3) Each authorized employee will be instructed in the purpose and use of the energy control procedure.
- 4) All affected employees, whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.
- 5) When tagout systems are used, authorized employees will also be trained in the following limitations of tags:
  - A) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
  - B) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
  - C) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
  - D) Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
  - E) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
  - F) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

## **Employee Retraining:**

- 1) Retraining will be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.
- 2) Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.



Tags will be constructed so that they will not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

- 2) Standardized. Lockout and tagout devices will be standardized within CCS in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized. (Refer to "Hazardous Energy Control Procedures" section of this manual for information regarding the specific lockout and tagout devices used at CCS.)
- 3) Substantial.
  - A) Lockout devices: Lockout devices will be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
  - B) Tagout devices: Tagout devices, including their means of attachment, will be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means will 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 and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.
- 4) Identifiable. Lockout devices and tagout devices will indicate the identity of the employee applying the device(s). Tagout devices will warn against hazardous conditions if the machine or equipment is energized and will include a legend such as the following: Do not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate.

#### **INSPECTION SYSTEM:**

The CCS Safety Coordinator and/or the Maintenance Supervisor to ensure that the procedures are being followed will conduct an inspection of the energy control procedures at least annually. The inspection system has been designed to assure correction of any deviations or inadequacies observed.

- 1) Where lockout is used for energy control, this periodic inspection will include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
- 2) Where tagout is used for energy control, this periodic inspection will include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and a review of the limitations of tags and the proper use of tags.

Documentation of the periodic inspections is required and will include identity of the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employee(s) included in the inspection, and the person(s) performing the inspection.

#### **MARKING OF DISCONNECTS AND VALVES:**

CCS will ensure that all disconnects and valves are clearly labeled unless they are located and arranged so their purpose is evident. The labeling shall include (a) equipment supplied; (b) energy type and magnitude. Employees will not be expected to guess what controls apply to what machines, or to trace piping or wiring to find the correct main controls. This is especially important when controls are remote from the equipment or on master panels containing several controls. The greater the equipment complexity, the greater the potential for error with respect to unlabeled or

inadequately identified isolating devices.

This may require an initial survey of the plant or operation to identify all energy sources, including a physical inspection, possibly in combination with drawings, equipment manuals, etc. Disconnecting means should be located and marked, with their function indicated. These identification details should be categorized as to the equipment supplied and the energy type and magnitude.

Where system complexity requires, a written sequence in checklist form should be prepared for equipment access, lockout/tagout, clearance, release, and start-up. Although simple lockout/tagout applications, such as one employee and one energy source, do not necessitate a prepared sequence, it is advisable to have available written listings of all equipment and the specific location of their energy isolating devices. The sequence(s) prepared in checklist form should reflect the developed order of energy isolating device activation, waiting times (if any), visual or audio signals, etc.

It is the responsibility of all maintenance staff who are a part of this program to document any significant machine alterations with which they are involved that effect the lock-out points required to reduce a machine's function to an inoperative status and to submit this documentation to the Maintenance Supervisor. This information is to be transmitted to all authorized staff prior to any maintenance work on the affected equipment.

#### **OUTSIDE PERSONNEL:**

Whenever outside servicing personnel (contractors, vendors, etc.) are to be engaged in activities covered by the scope and application of this program and the referenced CFR standard, CCS and the outside employer are to inform each other of their respective lockout or tagout procedures prior to the onset of on-site (CCS) work by the outside servicing personnel.

CCS will ensure that CCS employees understand and comply with restrictions and prohibitions of the outside employer's energy control procedures and will request that the outside employer's personnel understand and comply with restrictions and prohibitions of CCS's energy control procedures.

#### **HAZARDOUS ENERGY CONTROL PROCEDURES**

Community Colleges of Spokane

The procedures herein outlined are to be fully utilized by all authorized and affected CCS employees to ensure the control of energy in electrical circuits, movement of parts, or start-up or release of stored energy, fluids or gases when employees are engaged in activities specified in this program and the cited CFR standard.

These procedures clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, fluids or gases as well as the means to enforce compliance.

#### **EXCEPTION:**

The required procedures for a particular machine or equipment will not be documented when all of the following elements exist:

- 1) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees.

- 2) The machine or equipment has a single energy source, which can be readily identified and isolated.
- 3) The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment.
- 4) The machine or equipment is isolated from 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 reenergization of the machine or equipment during servicing or maintenance.

### **PRELIMINARY CONSIDERATIONS FOR LOCKOUT**

The following items should be considered when preparing for lockout:

- A) Job objectives and equipment involved.
- B) Estimated job duration.
- C) Personnel and skills involved.
- D) Personnel sign-on and -off positions.
- E) Type, number, and location of energy neutralization devices requiring lockout.
- F) Responsible and knowledgeable persons' approvals.
- G) Start-up provisions.

### **INTENDED USE**

These procedures apply to the control of energy during servicing and/or maintenance of machines and equipment at CCS (note "Exception" section of this manual for possible exceptions) and are to be followed by all authorized and affected CCS employees.

Implementation of lockout or the tagout system (energy isolation) will be performed only by authorized employees.

Affected employees will be notified by the employer or authorized employee of the application and removal of lockout devices or tagout devices. Notification will be given before the controls are applied, and after they are removed from the machine or equipment.

### **PREPARING FOR LOCKOUT**

- 1) Notification. The authorized individual who is performing the lockout and/or tagout is to notify all affected employees that a lockout and/or tagout system is going to be utilized and the reason for the lockout/tagout.
- 2) Preparation for shutdown.

- A) Before an authorized employee turns off a machine or equipment, the authorized employee must have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

This may require that a survey be made to locate and identify all isolating devices to be certain which switch(s), valve(s) or other energy isolating devices apply to the equipment to be locked or tagged out. More than one energy source (electrical, mechanical, or others) may be involved.

- B) The authorized employee will check to be sure that no one is operating the machinery BEFORE turning off the power.
- 3) For complex systems or processes, the sequence checklist must include equipment access, lockout, clearance, release and start up. Where hazards are present due to spring tension, charged electrical capacitors, suspended parts, chemical energy, etc., the checklist is to include steps to neutralize these hazards.

### **MACHINE/EQUIPMENT SHUTDOWN AND ISOLATION**

- 1) Machine or equipment shutdown. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of equipment deenergization.

If the machine or equipment is operating, it is to be shut down by the normal stopping procedure (depress stop button, open toggle switch, etc.).

All operating controls must remain off. Electrical disconnect switches are not to be pulled while under load (due to the possibility of arcing). They are to be tested to ensure that they are in the off position before the lockout is installed.

For electrical lockouts, never rely on a deactivated control circuit. The only sure way to lock out a circuit is at the main disconnect. Before testing the circuit, check your voltage tester on a known energized voltage source. The circuit should then be tested on the load side after opening the disconnect. Be sure that any interlocked circuits are safely de-energized. Test the control circuit in the starter and make certain it is deactivated. After performing voltage tests, recheck your tester on a known energized voltage source. Check to see that the machine is deactivated. Control or dissipate any electrical or other residual energy.

- 2) Machine or equipment isolation. All energy isolating devices that are needed to control the energy to the machine or equipment will be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

Steam, air, and hydraulic lines should be bled, drained, and cleaned out. There should be no pressure in these lines or in reservoir tanks.

Locking out one source of power to equipment may not be enough. Many machines use a combination of power supplies--electricity and pneumatic, steam and hydraulic, etc. These situations require the use of multiple lockouts on all sources of power.

Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s).

## LOCKOUT/TAGOUT APPLICATION

- 1) Lockout and/or tagout devices will be affixed to each energy-isolating device by authorized employees. ALL ENERGY SOURCES, WHICH COULD ACTIVATE THE MACHINE, MUST BE LOCKED OUT.

### Use of Warning Tags Only:

The use of warning tags without the use of locks in situations that are impossible or impractical for the application of a locking device may be done only under the following administrative controls:

- a) authorization by supervisory personnel
  - b) utilized only when the buddy system (2 people) is possible with direct eye or voice contact
  - c) designation of specific individual(s) allowed to place and remove tag(s)
  - d) training of all individuals who are authorized to place and remove tags and all individuals who may be exposed to tagged equipment.
- 2) Each person who will be working on the machinery should put a lock on the machine's lockout device(s). Each lock must remain on the machine until the work is completed. ONLY THE WORKER WHO PLACED THE LOCK SHOULD REMOVE HIS OR HER LOCK.
  - 3) Lockout devices, where used, will be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.
  - 4) Tagout devices, where used, will be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment will be fastened at the same point at which the lock would have been attached.

Where a tag cannot be affixed directly to the energy isolating device, the tag will be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

For electrically powered equipment, lockout devices preferably should be used on the remote disconnect or breaker switch, not the push-button control or switch on the machine itself. The remote disconnect is safer because there is less likelihood of a short circuit or other electrical malfunction.

- 5) VALVES: Valves controlling non-electrical sources of power, such as pneumatic, steam and hydraulic, should also have provisions for lockouts. Similar to electrical controls, valves should preferably be locked out on feeder lines rather than on the equipment itself. This is because several valves may control the power source piping at the equipment. The drawing below illustrates where lockouts should be placed on feeder line valves.

When an electric breaker or disconnect is opened, the circuit is dead. However, locking out upstream pressure in pneumatic or hydraulic lines also locks in downstream pressure, pressure that could result in inadvertent cycling of the machines or sudden release of the fluid or vapor.

The only positive solution to this problem is to use valves that incorporate automatic bleeders to release residual pressure, as illustrated in the drawing below:

## STORED ENERGY

There are conditions that are not hazardous during normal operations but become hazardous when guards are removed during maintenance and servicing. Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy will be relieved, disconnected, restrained, and otherwise rendered safe.

- 1) Stored energy (such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.
- 2) If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation will be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.
- 3) **Blocking:** Suitable blocks are an important safety device to make a piece of equipment safe to be repaired or serviced. Blocks must be placed under raised dies, lifts, or any equipment that might inadvertently move by sliding, falling, or rolling. Blocks, special brackets, or special stands such as those, which are commonly used under raised vehicles, must be available and always used. Another form of blocking is the placement of a blind. A blind is a disk of metal placed in a pipe to ensure that no air, steam, or other substance will pass through that point if the system is accidentally activated.

Before blinds or blocks are installed, bleed down stream, air, or hydraulic lines to get rid of any pressure. In addition, coiled springs, spring-loaded devices, or suspended loads must be released so that their stored energy will not result in inadvertent movement.

## VERIFICATION OF LOCKOUT

After ensuring that no personnel are exposed and prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee will verify that isolation and de-energization of the machine or equipment have been accomplished. (If the control to be locked out is remote from the machine to be worked on, it may be necessary to get another employee to check the machine and signal the employee-performing lockout.)

- 1) Operate the push button or other normal operating controls to make certain the equipment will not operate. The main valve or main electrical disconnect must be tested to be sure that the power to the machine is off.  
**CAUTION:** Return operating control(s) and disconnect(s) to "neutral" or "off" position after the test.
- 2) Electrical circuits must be checked by qualified persons with proper and calibrated electrical testing equipment. An electrical failure could energize the equipment, even if the switch is in the off position. Stored energy in electrical capacitors should be safely discharged.
- 3) The only foolproof lockout procedure is to open the switch and verify that the power is off by checking the outgoing wires for voltage with a voltmeter. Always verify the lockout with a voltage tester if direct contact with potentially live electrical components is possible.

## PLACEMENT OF WARNING TAGS

Attach accident prevention tags which give the reason for placing the tag, the name of the person placing the tag, how he or she may be contacted, and the date and time the tag was placed.

## **TESTING OR REPOSITIONING OF EQUIPMENT DURING LOCKOUT**

In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions must be followed:

- 1) Remove employees from the machine or equipment area. The work area must be checked to ensure that all employees have been safely positioned or removed. Before lockout or tagout devices are removed and before machines or equipment are energized, affected employees will be notified that the lockout or tagout devices have been removed.
- 2) Clear the machine or equipment of tools and materials. The work area will be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.
- 3) Remove the lockout and/or tagout devices. The employee who applied the device must remove each lockout or tagout device from each energy-isolating device. (Refer to item #4 under "Release From Lockout and Restoring Equipment to Service" below.)
- 4) Re-energize systems following the established safe work procedures and proceed with testing or positioning.
- 5) Deenergize all systems again, purge all systems, and reapply energy control measures as outlined above prior to continuing work.

## **RELEASE FROM LOCKOUT AND RESTORING EQUIPMENT TO SERVICE**

After the work is completed and the equipment is ready to be returned to normal operation, the procedure outlined below must be followed before lockout and/or tagout devices are removed and energy is restored to the machine or equipment:

- 1) The machine or equipment. Inspect the work area to ensure that nonessential items have been removed. Check to be sure that all equipment components are operationally intact, including guards and safety devices. Repair or replace defective guards before removing lockouts.
- 2) Employees. Check the work area to ensure that all employees have been safely positioned or removed.
- 3) Before lockout and/or tagout devices are removed and before machines or equipment are energized, notify affected employees that the lockout or tagout devices are being removed.
- 4) Lockout or tagout devices removal. The employee who applied the device will remove each lockout or tagout device from each energy-isolating device. Exception: When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the employer, provided that the specific procedure outlined below is followed and training for such removal has been given. This procedure is designed to provide equivalent safety to the removal of the device by the authorized employee who applied it.
  - a) Only the Maintenance Supervisor or the Director of Facilities is authorized to remove a lock which has been placed by another authorized employee.

- b) Before removal can occur, irrefutable verification must be made that the original authorized employee is not on the premises.
  - c) All reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed must be made.
  - c) The Maintenance Supervisor (or designee) must ensure that the authorized employee has this knowledge before he/she resumes work at that facility.
- 5) Make a visual check before restoring energy to ensure that everyone is physically clear of the equipment.

## **GROUP LOCKOUT OR TAGOUT**

- 1) When servicing and/or maintenance is performed by a crew, craft, department or other group, they will utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.
- 2) Group lockout or tagout devices will be used as previously outlined in this document, including, but not necessarily limited to, the following specific requirements:
  - a) Primary responsibility is vested in an authorized employee (herein referred to as the "designated operation supervisor") for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock).
  - b) There is provision for the designated operation supervisor to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment.
  - c) When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility is made to an authorized employee (herein referred to as the "designated operation coordinator") designated to coordinate affected work forces and ensure continuity of protection.
  - d) Each authorized employee will affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and will remove those devices when he or she stops working on the machine or equipment being serviced or maintained. When possible, the locks and tags of the designated operation supervisor or of the designated operation coordinator will be put on first and removed last.
  - e) The last person to remove his/her lockout device and tag is to make sure the work is complete and the equipment is safe to operate.

## **SHIFT OR PERSONNEL CHANGES**

Specific procedures will be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout devices between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization, start-up of the machine or equipment, or release of stored energy. Thorough communication between in-coming and out-going maintenance personnel is essential. The relief worker(s) is to put his/her lock on before the authorized employee leaving shift removes his/hers.

## **REMOVAL OF LOCKOUT DEVICES BY AUTHORIZED MANAGEMENT PERSONNEL DURING EMERGENCIES AND UNUSUAL CIRCUMSTANCES**

Normally, only the person who places the lock is allowed to remove it. However, there may be unusual circumstances or emergencies, which arise that require the removal of a lock in the absence of the individual who placed it. The following procedures are required in such circumstances:

- 1) Only the Maintenance Supervisor or the Director of Facilities is authorized to remove a lock, which has been placed by another authorized employee.
- 2) Before removal can occur, irrefutable verification must be made that the original authorized employee is not on the premises.
- 3) All reasonable efforts must be made to notify him/her of removal so that he/she is aware of removal before returning to work (e.g., when he/she first arrives at the plant).
- 4) The Maintenance Supervisor (or designee) must ensure that the authorized employee has this knowledge before he/she resumes work at that facility.

## **HAZARDOUS ENERGY CONTROL PROCEDURE SUMMARY**

### **Community Colleges of Spokane**

#### **Purpose**

*This procedure establishes the minimum requirements for lockout of energy sources that could cause injury to personnel. All affected employees shall comply with the procedure.*

#### **Responsibility**

*The responsibility for seeing that this procedure is followed is binding upon all affected employees. All affected employees shall be instructed in the safety significance of the lockout procedure by the Building Maintenance Supervisor and the CCS Safety Coordinator. They shall also instruct each new or transferred affected employee in the purpose and use of the lockout procedure.*

#### **Rules for Using Lockout Procedure**

*All equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy-isolating device bearing a lock.*

#### **Preparation for Lockout**

*Employees authorized to perform lockout shall be certain as to which switch, valve, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, or others) may be involved. Any questionable identification of sources shall be cleared by the employees with their supervisors before lockout commences.*

#### **Sequence of Lockout Procedure**

- 1) *Notify all affected employees that a lockout is required and the reason.*
- 2) *If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.)*
- 3) *Operate the switch, valve, or other energy isolating devices so that the energy source(s) (electrical, mechanical, hydraulic, etc.) is disconnected or isolated from the equipment. Stored energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc. must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.*
- 4) *Lockout energy isolating devices with an assigned individual lock.*
- 5) *After ensuring that no personnel are exposed and as a check on having disconnected 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 position after the test.*
- 6) *The equipment is now locked out.*

#### **Restoring Equipment to Service**

- 1) *When the job is complete and equipment is ready for testing or normal service, check the equipment area to see that no one is exposed.*
- 2) *When equipment is clear, remove all locks. The energy isolating devices may be operated to restore energy to equipment.*

#### **Procedure Involving More than One Person**

*In the preceding steps, if more than one individual is required to lock out equipment, each shall place his/her own personal lock on the energy isolating device(s).*