

 <b>CITY OF TUCSON</b>	<b>City of Tucson</b> Central Safety Services Number: S-009 Subject:	Page 1 of 12
	<b>Control of Hazardous Energy          Lockout/Tagout/Tryout</b>	Effective Date: January 1, 1997
		Reviewed/ Revised: January 1, 2013

## 1.0 PURPOSE

To protect City of Tucson employees and contractors with an energy control procedure. This procedure shall be used while performing service and maintenance of machines and equipment for which the **unexpected** startup or release of stored energy could cause injury.

## 2.0 SCOPE

- A. Any service and/or maintenance of machines or equipment when the source of energy to the machines or equipment is electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
- B. Constructing, installing, setting up, adjusting, inspecting, modifying, maintaining and/or servicing machines or equipment, including lubrication, cleaning or un-jamming of machines or equipment, and making adjustments or tool changes, where employees could be exposed to the unexpected re-energizing or startup of the equipment or release of hazardous energy.
- C. The policies and procedures contained in this section are intended to assist in identifying and complying with OSHA Safety Standards. In all cases where there is a difference between specific OSHA standards and the Lockout/Tagout/Tryout policies set forth in this chapter, the stricter of the two shall apply.

## 3.0 DEFINITIONS

**Authorized employee:** An employee who locks or tags machines or equipment in order to perform service or maintenance.

**Affected employee:** An employee who is required to use machines or equipment on which service is performed under the Lockout/Tagout standard or who performs other job responsibilities in an area where such service is performed.

**Capable of being locked out:** An energy-isolating device is considered capable of being locked out if it:

- Is designed with a hasp or other means of attachment to which a lock can be affixed;
- Has a built-in locking mechanism;
- Can be locked without dismantling, rebuilding, or replacing the energy-isolating device or permanently altering its energy control capability.

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**Energized:** Machines and equipment are energized when they are connected to an energy source or they contain residual or stored energy.

**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.

**Note: Push buttons, selector switches and other control circuit type devices are not energy isolating devices.**

**Energy source:** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

**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.

**Lockout device:** Any device that uses positive means, such as a lock, blank flanges and bolted slip blinds, to hold an energy-isolating device in a safe position, thereby preventing the energizing of machinery or equipment.

**Normal production operations:** Utilization of a machine or equipment to perform its intended production function.

**Other employees:** All employees who are or may be in an area where energy control procedures may be utilized.

**Service and/or Maintenance:** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, maintaining and/or servicing machines or equipment, including lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, where employees could be exposed to the unexpected re-energizing or startup of the equipment or release of hazardous energy.

**Tagout:** The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating

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device and the equipment being controlled may not be operated until the tagout device is removed.

**Tagout device:** Any prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy-isolating device to indicate that the machine or equipment to which it is attached may not be operated until the tagout device is removed.

**Tryout:** The process of utilizing the on/off switch to shut-down equipment prior to de-energizing, to ensure the on/off device is functioning as designed **and** the means to test that the equipment has been effectively de-energized after the application of the Lockout/Tagout device, to verify that a zero-energy state has been achieved.

#### 4.0 RESPONSIBILITIES

##### A. Central Safety Services

Central Safety Services shall ensure that the lockout/tagout/tryout procedures are in compliance with OSHA requirements. CSS will provide materials, lesson plans, resources to department representatives as needed.

##### B. Departments

Department Directors shall ensure that each supervisor adheres to the written procedures.

##### C. Supervisors

1. Supervision will verify that employees have received training in energy control procedures prior to operating the machinery or equipment and ensure that each employee and contractors engaging in work requiring locking/tagging/trying out of energy sources understands and adheres to adopted procedures.
2. Provide and maintain necessary equipment and resources, including accident prevention signs, tags, unique padlocks, seals and/or similarly effective means.
3. Inspect energy control procedures and practices at least annually to ensure that general and specific lockout/tagout/tryout procedures are being followed:
  - a. Inspections shall be carried out by persons other than those employees directly utilizing energy control procedures.
  - b. Inspections shall include a review between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.
  - c. Certify that periodic inspections have been performed.

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#### **D. Employees**

Employees shall adhere to specific procedures as outlined in appendix A in this document for all tasks that require the use of lockout/tagout/tryout procedures as defined and shall maintain lockout/tagout supplies in work vehicles.

### **5.0 EDUCATION AND TRAINING**

1. Training will be given to ensure that all affected employees understand the purpose and function of the lockout/tagout/tryout program and so that employees acquire the knowledge and skills necessary for the safe application, usage and removal of the energy controls. The standard requires different levels of training for the three categories of employees:
  - a. Authorized employees must receive training on 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 device.
  - a. Affected employees must receive training on the purpose and use of the energy control procedure.
  - b. Other employees (those whose work activities are or may be in an area where energy control procedures may be utilized) must be instructed about the procedure and about the prohibition relating to attempts to restart or reenergize machines or equipment that are locked out or tagged out.

#### **A. Additional Training**

Departments must train employees in the following limitations of tags:

1. 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;
2. When a tag is attached to an energy isolating means, it is not to be removed without authorization and it is never to be bypassed, ignored, or otherwise defeated;
3. Tags must be legible, dated, signed and understandable by all Authorized Employees and replaced when illegible;
4. Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace;
5. Tags may evoke a false sense of security and their meaning needs to be understood as part of the overall energy control program;
6. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

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## **B. Re-Training**

1. Employees shall be re-trained when:
  - a. There is a change in job assignments;
  - b. A change in machines, equipment, or processes that present a new hazard;
  - c. A change in the energy control procedures;
  - d. Periodic inspections reveal that there are deviations in the energy control procedure;
  - e. The employer believes that there are deviations from, or inadequacies in, the employee's knowledge or use of the energy control procedures.
2. Employee training shall be documented and kept up to date by the supervisor and forwarded to Central Safety Services for inclusion in the employee's training file. The document shall contain each employee's name, employee number and the dates of training.

## **6.0 GENERAL**

### **A. LO/TO/TO Procedure**

The following are the general procedures to be followed during the control of hazardous energy while service and/or maintenance is performed on machines or equipment. See departmental-specific energy control procedures before performing work on equipment. (See Appendix A for examples).

#### **1. Notification - Preparation for shutdown**

Before an authorized or affected 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, and the affect of the equipment shutdown may have on employees or customers.

#### **2. Machine or equipment shutdown**

The machine or equipment must be turned off or shut down using the procedures established for it to avoid any additional or increased hazards to employees as a result of the machine or equipment stoppage.

#### **3. Machine or equipment isolation**

All energy-isolating devices that are needed to control the machine's energy source must be located. These devices must then be used to isolate the machine or equipment from its energy source(s).

4. Lockout/Tagout/Tryout shall be performed by each effected employee in prior to the start of any repair or maintenance function in the following manner:

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- a. The power switch will be turned to the off position in order to verify that the switch is operating as designed; shutting down the equipment.
- b. The lockout device shall be applied to the disconnecting means.
- c. The tag shall be applied to the lockout device or in cases where a lockout device cannot be affixed to the equipment, the tag shall be applied.
- d. Multiple attempts shall be made to start the equipment utilizing the power switch, **prior** to removing any guard to perform a repair or maintenance function. After multiple attempts, the switch shall be returned and verified to the "off" position.
- e. If equipment does is not equipped with a power switch or similar, a de-energized state shall be achieved by utilizing the procedure defined in Paragraph 7 of this section.

**5. Lockout or tagout device application**

Lockout or tagout devices must be affixed to each energy-isolating device by authorized employees. Lockout devices where used, must be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position. Where tagout devices are used, it must be affixed in a manner that will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited. If the tag can not be affixed directly to the energy isolating device, the tag must 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.

**6. Stored energy**

After the energy-isolating device has been locked out or tagged out, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, blocked, and/or otherwise rendered safe.

**7. Verification of isolation**

Before any work begins on machines or equipment that have been locked out or tagged out, an authorized employee must verify that the machine or equipment has been properly isolated and de-energized by tryout method or verification of zero voltage by application of a rated meter.

**8. Machine/equipment inspection**

The work area must be inspected to ensure that nonessential items (e.g., tools, spare parts) have been removed and that all of the machine or equipment components are operationally intact.

**9. Positioning of employees**

- a. The work area must be checked to ensure that all employees have been safely positioned or have cleared the area. In addition, all

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affected employees must be notified that the lockout or tagout devices have been removed before the equipment is started.

#### 10. **Lockout or tagout device removal**

Each lockout or tagout device must be removed from the energy-isolating device by the employee who applied the device. 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 specific procedures and training for such removal have been developed, documented, and incorporated into the employer's energy control program.

- a) The employer must verify that the authorized employee who applied the device is not at the facility.
- b) The employer must make all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed.
- c) The employer must ensure that the authorized employee knows that the lockout device has been removed before he/she resumes work at the facility.

#### 11. **Re-Energize**

- a. Prior to re-energizing the employee will follow the following safe practice procedure:
  - 1) Stand to the side of the disconnecting means;
  - 2) Avert their face (turn the head) to the side;
  - 3) Take a deep breath;
  - 4) Activate the disconnecting means with the "off" hand.

#### **B. Testing of Machines**

In some circumstances, employees need to temporarily restore energy to a machine or piece of equipment during servicing or maintenance to test and /or reposition the machine or piece of equipment. Lockout or tagout devices may be removed temporarily in order to perform these five tasks:

- 1) The machine or equipment must be cleared of tools and materials.
- 2) Employees must be removed from the machine or equipment area.
- 3) All lockout or tagout devices may then be removed.
- 4) Authorized employees may then proceed to energize and test or position the equipment or machinery.
- 5) Following testing or positioning, all systems must be de-energized and energy control measures reapplied to continue the servicing and /or maintenance.

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**C. Outside Personnel (Contractors)**

1. Whenever contractors and other outside servicing personnel perform tasks covered by the Lockout/Tagout standard, they must adhere to all the standard's requirements.
2. The contractor or outside employer and the on-site employer must inform each other of their respective lockout or tagout procedures.
3. The on-site employer must ensure that his/her employees understand and prohibitions of the outside employer's energy control program.

**D. Group Lockout/Tagout Requirements**

1. Protection must be utilized which affords multiple employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.
2. Primary responsibility for a set number of employees working under the protection of a group lockout or tagout device must be vested in a single authorized employee.
3. The single authorized employee must determine the exposure status of individual group members.
4. If there will be more than one crew, department, or group involved in the activity, a single authorized employee must be designated to coordinate affected workforces and to ensure continuity of protection.
5. Each authorized employee must affix a personal lockout or tagout device as required in the standard when work begins and remove it when work is completed.

**E. Shift and Personnel Changes**

Employers must ensure the continuity of employee protection by providing for the orderly transfer of lockout or tagout device protection between off-going and incoming employees. This will help to minimize exposure to hazards from the unexpected re-energizing or start-up of the machine or equipment or the release of stored energy.

**7.0 ADVICE AND COUNCIL**

Central Safety Services shall provide advice and council on this procedure.

OSHA 1910.147

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## APPENDIX A

### General

The following simple lockout procedure is provided to assist employers in developing their procedures so they meet the requirements of this standard. When the energy isolating devices are not lockable, tagout may be used, provided the employer complies with the provisions of the standard which require additional training and more rigorous periodic inspections. When tagout is used and the energy isolating devices are lockable, the employer must provide full employee protection and additional training and more rigorous periodic inspections are required. For more complex systems, more comprehensive procedures may need to be developed, documented, and utilized.

### Lockout Procedure

Lockout Procedure for \_\_\_\_\_

### Purpose

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

### Compliance With This Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize, or use that machine or equipment.

**Compliance enforcement to be taken for violation of the above may involve disciplinary time off and/or ultimately lead to termination.**

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**Sequence of Lockout**

(1) Notify all affected employees 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.

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**Name(s)/Job Title(s) of affected employees and how to notify.**

(2) The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

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**Type(s) and magnitude(s) of energy, its hazards and the methods to control the energy.**

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

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**Type(s) and location(s) of machine or equipment operating controls.**

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(4) De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).

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**Type(s) and location(s) of energy isolating devices.**

(5) Lock out the energy isolating device(s) with assigned individual lock(s).

(6) 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.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

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**Type(s) of stored energy - methods to dissipate or restrain.**

(7) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, 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.**

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**Method of verifying the isolation of the equipment.**

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(8) The machine or equipment is now locked out.

"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.

- (1) Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- (2) Check the work area to ensure that all employees have been safely positioned or removed from the area.
- (3) Verify that the controls are in neutral.
- (4) Remove the lockout devices and reenergize the machine or equipment. Note: The removal of some forms of blocking may require re-energizing of the machine before safe removal.
- 5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for used.