ADMINISTRATIVE PROCEDURES

Procedure Number: 30-5

Effective Date: 09/21/1995
Revision Date:

County Administrator

SUBJECT: **LOCKOUT/TAGOUT**

DEPARTMENT RESPONSIBLE: **Risk Management**

I. Purpose

The purpose of this program is to provide information and establish minimum requirements for the lockout of energy isolating devices whenever Pima County employees perform maintenance or service on machines or equipment.

II. Scope

This program covers the servicing and maintenance of machines and equipment in which the unexpected energization or startup of the machines or equipment, or released of stored energy could cause injury to employees. This program establishes minimum performance requirements for the control of such hazardous energy as prescribed in OSHA (29 CFR 1910.147).

A. Exclusions

The following procedures are not covered by this program:

1. 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 he equipment for production, provided that the work is performed using alternative measures which provide effective protection.

2. Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up fo the equipment is controlled by the unplugging of the equipment from the energy sources and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

3. 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: continuity of services is essential; shutdown of the system is impractical; and documented

procedures are followed, and special equipment is used which will provide proven effective protection for employees.

III. Definitions

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

B. *Authorized employee* - A person who locks out or tags out machines or equipment in order to perform service or maintenance on that machine or equipment. An *affected employee* becomes an authorized employee when that employee's duties include performing service or maintenance covered under this section.

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. Over 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.

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 undergrounded supply conductors and; in addition, no pole can be operated independently; a line valve; a block; any similar device used to block or isolate energy. Push buttons, selector switches 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.

G. *Hot tap* - A procedure used in the repair, maintenance and service activities which involves making a connection to equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenance. 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 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 prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds. The standard lockout device for Pima County shall be a red key lock, individually keyed with no master key. Maintenance supervisors in each affected

department will assign a numbered red lock to each *authorized employee.* Supervisors will be responsible for determining the manufacturer and model of all locks, supervisory and individual, used in the lockout procedure. This is to ensure uniformity and to control the issuing of keys and the obtaining of replacement keys when such are needed.

I. *Lockout* - The placement of a lockout device on an energy isolating device, in accordance with this established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

J. *Normal production operations* - The utilization of a machine or equipment to perform its intended production function.

K. *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 machines or equipment and making adjustments or tool changes whether scheduled or performed on an emergency basis, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

L. *Setting up* - Any work performed to prepare a machine or equipment to perform its normal production operation.

M. *Supervisory lockout* - A supervisor or operational lockout is the placement of a lockout or tagout device by operational personnel or maintenance supervisors and is designed to maintain the equipment in an out-of-service condition during times when no authorized employees are actively working on the equipment. Such locks shall be gold in color, and may be keyed individually or in groups. Master keys for supervisory lock is not to protect the safety of any individual employee. Any supervisor may be authorized to remove a supervisory lock placed by another supervisor.

N. *Tagout* - The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

O. *Tagout device* - A prominent warning device, such as a tag and a means of attachment, which can be securely fasted 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.

IV. General

Pima County has established a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any service or maintenance on a machine or equipment where the unexpected energizing, startup or

release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative.

V. Lockout/Tagout

A. General

1. If an energy isolating device is not capable of being locked out, employees shall utilize a tagout system as described below.

2. If an energy isolating device is capable of being locked out, employees shall utilize lockout.

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

B. Full Employee Protection

Tags are not permitted to be used in place of locks on any energy isolating device which is designed to accept a lock. In such cases, a lock may be used. In the case of equipment not capable of being locked out, a tagout device may be used provided that:

1. When a tagout device is used, the tagout device shall be attached at the same location that the lockout device would have been attached, and the employer shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

2. In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, the department shall demonstrate full compliance with all tagout related provisions of this 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 shall 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.

C. Energy Control Procedure

The following procedures shall be documented and utilized for the control of potentially hazardous energy when employees are engages in the activities covered by this section.

1. *Energy Isolation* - The placement of lockout or tagout devices shall be performed only by the *authorized employees* who are performing the servicing or maintenance. This requirement applies only to the individual (red) locks and does not apply to the gold supervisory (operational) locks.

2. *Notification of employees* - Affected employees shall be notified of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

3. *Application of control* - The following elements and actions shall be done in sequence:

   a. *Preparation for shutdown* - Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall 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.

   b. *Machine or equipment shutdown* - The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazards(s) to employees as a result of the equipment stoppage. Such procedures may be the equipment manufacturers instructions, operating manuals, standard operating procedures or any other appropriate procedure, written or unwritten.

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

   d. Lockout or tagout device application

      1) Lockout or tagout devices shall be affixed to each energy isolating device by *authorized employees.* Where supervisory or operational locks are used to secure equipment, such locks shall be readily identifiable as different from the individual locks used by authorized employees. The use of locks of contrasting color (red versus gold) satisfies this requirement. Each lockout device shall be accompanied by a tag which provides the name of the authorized employee placing the device, the date the device was placed, and the reason for the lockout.

      2) Lockout devices, where used, shall be affixed in a manner that will hold the energy isolating devices in a "safe" or "off position.

      3) Tagout devices, where used, shall 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.

a) Tagout devices alone are not permitted to be used with energy isolating devices designed with the capability of being locked.

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

c) Tags used alone as tagout devices, or tags used in conjunction with lockout devices are to be maintained in a legible, readable condition. It is the responsibility of the *authorized employee* who affixes the tag to maintain it. Supervisor tags are also to be maintained in a readable condition by the employee or section responsible for placing the tag.

d) Supervisory Lockout and Tagout devices are not considered to be part of this procedure, but are defined here in order to clearly differentiate them from Lockout and Tagout devices placed on equipment pursuant to this procedure. Supervisory locks and tags may be placed on equipment or removed from equipment by any employee authorized to do so by local procedures. Details of the use of such locks and tags, including the keying of locks, existence of masters, etc. is to be determined by supervision at each facility and is not subject to any restrictions under this procedure.

e. Stored Energy

1) Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

2) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the service or maintenance is completed, or until the possibility of such accumulation no longer exists.

f. Verification of Isolation

Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and de-energization of the machine or equipment have been accomplished. This will be accomplished by attempting or start or energize the equipment. Return all starting controls to the off position, or push the STOP button, before proceeding with the service or maintenance work.

D. Exceptions

Written procedures are not required for locking out a particular machine or piece of equipment, when all 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 de-energize and de-activate 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 service or maintenance does not create hazards for other employee; and

8. Pima County, in utilizing this exception, has had no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.

VI. Release From Lockout or Tagout

A. Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the *authorized employee(s)* to ensure the following:

1. The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact. In the case of *authorized employees* leaving a job site before completion of the work (such as end of shift or reassignment), each employee will be responsible for cleaning his/her own portion of the job, communicating to supervision or other *authorized employees* the status of their portion of the task, then removing their own individual (red) lock or tag.

2. The work area shall be checked to ensure that all employees have been safety positioned or removed.

3. Before lockout or tagout devices are removed and before machines or equipment are energized or started, *affected employees* shall be notified that the lockout or tagout device have been removed.

B. Lockout or tagout devices removal

1. Each lockout or tagout device shall be removed from each 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 supervisor. The supervisor shall, as a minimum, take the following steps.

a. Verify that the authorized employee who applied the device is not at the facility.

b. Make all reasonable efforts to contact the authorized employee, to inform him/her that his/her lockout or tagout device is to be removed

c. Their person authorizing the removal of the lockout or tagout device has inspected the equipment and verified that no employees are at risk and that the equipment is ready to be placed in service.

d. Ensure that the authorized employee has this knowledge before he/she resumes work at the facility.

2. Any removal of another employee's lockout or tagout device is to be documented and is to be reviewed by the senior management within the affected department/division. A copy of the report is to be sent to Risk Management within 3 working day of the incident. The report will document the circumstances of the original placement of the lockout or tagout device, the reason for the unavailability of the authorized employee, the steps taken to verify the employee's absence from the worksite, the attempts to contact the employee, the identity of the supervisor who determined that it was safe to place the equipment back in service, and the method used to notify the employee that the lockout or tagout device had been removed.

VII. Additional Requirements

A. Testing or positioning of machines, equipment or components thereof. 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 the sequence of actions hall be followed:

1. clear the machine or equipment of tool and materials;

2. remove employees from the machine or equipment area;

3. remove the specific lockout or tagout devices;

4. energize and proceed with testing or positioning;

5. deenergize all systems and reapply energy control measures to continue the servicing and/or maintenance.

B. Outside Personnel (Contractors, etc.)

1. Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this program, the departments and the outside employer shall inform each other of their respective lockout or tagout procedures. The more stringent program shall be observed, complied with the enforced.

2. Department shall ensure that their employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

C. Group Lockout or Tagout

1. Under this procedure, the use of one lock to protect the safety of more than one employee is prohibited. Note that a single supervisory lock or tag may be used on valves which are shut during the isolation procedure; however, any valve which is the critical or only isolating device must be locked or tagged out in compliance with this procedure. The critical valve will normally be that valve in the system closest to the point of work being performed which constitutes the carrier between the hazardous energy source and the employee.

D. Shift or Personnel Changes

1. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision of the orderly transfer of lockout or tagout device protection between off going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start up of the machine or equipment, or the release of stored energy. This requirement will be met through strict observance of the procedures an individual employees uses to place and remove an individual (red) lock or tagging device.

VIII. Periodic Inspection

A. Departments shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.

B. The periodic inspection shall be performed by the Department's Assistant Director, Maintenance Supervisor or a representative of Pima County Risk Management.

C. The periodic inspection shall be conducted to identify any deviations or inadequacies; the procedure of its implementation will be modified to correct such deficiencies.

D. Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee participating in the lockout being inspected, of that employee's responsibilities under the energy control procedure being inspected.

E. Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee participating in the tagout being inspected, of that employee's responsibilities under the energy control procedure being inspected.

F. Department shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection. These records will be maintained by each area and copies forwarded to the department and Risk Management for review. Records will be maintained for a period of five years.

IX. Training and Communication

A. Departments shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage and removal of the energy controls are acquired by employees. The training shall include the following:

1. Each authorized employee shall 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.

2. Each *affected employee* shall be instructed in the purpose and use of the energy control procedure.

3. All other 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 re-energize machines or equipment which are locked out or tagged out.

B. When tagout systems are used, employees shall also be trained 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 to be removed only by the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated. Removal of a tag when the authorized employee is not at the worksite is to be accomplished using the same procedure used for removing a lockout device in a similar situation. See section VI.B.

3. 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 areas, in order to be effective.

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.

C. The department shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training. Each area will maintain records of such training for the employees of that area. Training records are to be considered permanent records.

X. Employee Retraining

A. Retraining shall be provided for all authorized and affected employees whenever there is a change in there 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.

B. 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.

C. The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

D. The department shall certify that employee retraining has been accomplished and is being kept up to date. The certification shall contain each employee's name, the dates of training and the name of the trainer. Retaining records are to be considered as part of the permanent training records.

XI. Protective Materials and Hardware

A. Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the department for isolating, securing or blocking of machines or equipment from energy sources.

B. Lockout devices and tagout devices shall be singularly identified; shall be the only device(s) used for controlling energy; shall not be sued for other purposes; and shall meet the following requirements:

1. Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

2. Tagout devices shall be constructed and printed so that exposure to environmental conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

3. Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

4. Lockout and tagout devices shall be standardized within the department in the following criteria: color; shape; and size; and in the case of tagout devices, print and format shall be standardized as well.

5. Lockout devices shall 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.

6. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non reusable type, attachable by hand, self locking, and non releaseable with a minimum of 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.

7. Lockout devices and tagout devices shall indicate the identity of the employee applying the devices(s). Lockout devices (key locks) shall have a unique identifying number; all other devices or tags shall have on them the employees name. Each lock shall be accompanied by a tag which state the employee's name, the date the device was applied, and the reason for the lockout. Lockout devices which do not have provision of such identification shall be accompanied by a tag displaying the required data.

8. Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate.

XII. References

A. OSHA 29 CFR 1910.147