

**TRIO Wolf Creek Distance Learning Charter School #4095**

**Procedure 111**

**Hazardous Energy Control Plan  
(Lockout/Tagout)**

Prepared for:

**Trio Wolf Creek  
Distance Learning Charter School  
#4095**

Prepared by:

***Chisago Lakes Area Schools  
ISD #2144***

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### Hazardous Energy Control Plan (LO/TO) Management Plan Update Report

#### Trio Wolf Creek Distance Learning Charter School

#### Initial Hazardous Energy Control Plan (LO/TO) Management Plan developed:

Initial: 2009, most recent previous to \_\_\_\_\_ Revision was May 16, 2018.

#### The process used for updating the Hazardous Energy Control Plan (LO/TO) Management Plan was:

In response to recent regional OSHA inspections.

#### The changes in the Hazardous Energy Control Plan (LO/TO) policies in the Plan include:

Hazardous Energy Inventory compiled August, 2009.

Other significant changes in the plan include:

None.

The Trio Wolf Creek Distance Learning Charter School Hazardous Energy Control Plan (LO/TO) Health and Safety Committee reviewed the updated Hazardous Energy Control Plan (LO/TO) Management Plan:

The School Board action/approval was taken on: June 12, 2018.

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- G. The Control of Hazardous Energy 29 CFR 1910.147  
(Refer to Master Regulations Manual)

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### **Introduction**

This Hazardous Energy Control Plan is designed to help the Trio Wolf Creek Distance Learning Charter School to comply with The Control of Hazardous Energy, OSHA Standard 29 CFR 1910.147. These standards cover the servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machines or equipment, or release of stored energy could cause injury to the Trio Wolf Creek Distance Learning Charter School employees. The Lockout Program Compliance Checklist can be found in Appendix A.

References to Lockout, Lockout/Tagout or Hazardous Energy Control will be the same.

In addition, the Trio Wolf Creek Distance Learning Charter School is responsible for the implementation, enforcement and updating of their Lockout Plan. It is recommended that the Plan be reviewed and updated annually or when the addition or modification of equipment or machinery needs to be addressed according to the state or federal standard.

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### Definitions

#### **Affected Employee**

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

#### **Authorized Employee**

A person who locks out or tags out machines or equipment to perform the servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under these standards.

#### **Energized**

Connected to an energy source or containing 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. Push buttons, selector switches and other control circuit type devices are not energizing 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**

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.

#### **Servicing and/or Maintenance**

Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start-up of the equipment or release of hazardous energy.

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### Setting Up

Any work performed to prepare a machine or equipment to perform its normal operation.

### 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. *This is a supplemental procedure to lockout.*

### 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. *A tagout device is a supplemental device to locks.*

### Energy Control Program

The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing 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.

### Lockout/Tagout

If an energy isolating device is not capable of being locked out, the employer's energy control program shall utilize a tagout system. Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace. Tags may evoke a false sense of security.

If an energy isolating device is capable of being locked out, the employer's energy control program shall utilize lockout, *unless an employer can demonstrate that the utilization of a tagout system will provide full employee protection as required by this standard.*

*After January 2, 1990, whenever replacement or major repair, renovation or modification of a machine or equipment is performed, or whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.*

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### **Written Program**

#### **A. General**

The Trio Wolf Creek Distance Learning Charter School, like most other organizations that maintain buildings, building systems and other mechanical equipment are covered by the state and federal lockout/tagout legislation as previously noted. Maintenance and service of electrical equipment and machines, compressed air and pneumatic systems, are but a few of the potential areas that the lockout/tagout standard affects Trio Wolf Creek Distance Learning Charter School and their employees.

Lockout is the preferred method of isolating machines or equipment from energy sources. To assist in developing a procedure which meets the requirements of the standards, however, the following simple procedure is provided for use in both lockout and tagout programs. This procedure may be used when there are limited numbers or types of machines or equipment, or there is a single power source. For more complex systems, a more comprehensive program will need to be developed, documented, and utilized by the Trio Wolf Creek Distance Learning Charter School.

This Plan covers the basic requirements for the lockout or tagout of energy isolating devices. It must be used to ensure that the machine or piece of equipment is isolated from potentially hazardous energy and locked out or tagged out only if the equipment is not capable of being locked out before employees perform servicing or maintenance activities where the unexpected energization, start-up or release of stored energy could cause injury. Appendix B Equipment Inventory Sheet for Lockout is an inventory of equipment or machinery which may require written lockout procedures to meet program requirements.

#### **B. Responsibilities Under Plan**

The Trio Wolf Creek Distance Learning Charter School is responsible for implementation of the plan and for assigning responsibilities under the plan. All employees are expected to comply with plan requirements.

Authorized employees shall receive training to ensure that the purpose and function of the energy control or lockout/tagout program are understood and that the knowledge and skills required for the safe application, usage and removal of the energy controls are acquired by employees. Authorized employees are responsible for understanding and applying proper energy control procedures. Only authorized employees may lockout or tagout machines or equipment.

Employees working on equipment or machinery requiring service or maintenance under lockout/tagout procedures are affected employees. Each new or transferred affected employee, and any other employee whose work operations are or may be in the area, should be instructed in the purpose and use of the lockout or tagout procedure and are responsible for following the procedure. Both authorized and affected employees are

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identified on the applicable Energy Control Procedure Form. These forms are used for documentation of lockout/tagout procedures and are contained in Appendix E. The documents should be referred to before, during and after a lockout or tagout operation. Affected employees will be notified by the authorized employees whenever lockout or tagout will occur, and also informed as to when the equipment will be placed back in service. Compliance by all employees is mandatory.

It is the responsibility of the supervisor or other representative designated by the Trio Wolf Creek Distance Learning Charter School to approve all lockout/tagout procedures and ensure appropriate training is provided. Individuals responsible for approving lockout/tagout procedures:

<u>NAME</u>	<u>TITLE</u>	<u>DEPARTMENT</u>	<u>LOCATION</u>
Steve Mikutowski	CL Maintenance Director	Chisago Lakes ISD 2144-Dist.	Office

Specific lockout/tagout procedures shall be posted on or in the immediate vicinity of each machine included in Appendix B Equipment Inventory Sheet. These procedures will include a step by step process to lockout/tagout, identify the equipment to be used and indicate where the equipment or tag is to be placed on the machine to control the energy (See Appendix D Typical Minimal Lockout Procedure).

### C. Lockout/Tagout Preparation

Authorized employees will first review the proper lockout/tagout procedures for the equipment or machine to be locked or tagged out. If changes need to be made to the procedures, based on changes to the equipment and/or personnel, the authorized employee will make the necessary corrections before proceeding with lockout/tagout recording those changes on the Energy Control Procedure Form (Appendix E) and on the affected machine or piece of equipment.

Identify employees that may be affected by the impending lockout.

Obtain the necessary locks (tags) and/or devices to implement the lockout.

The specific lockout procedure for each machine or piece of equipment is detailed on the specific Energy Control Procedure Form (Appendix E).

### D. Equipment

The Trio Wolf Creek Distance Learning Charter School is responsible for providing the locks, tags, chains, wedges, key blocks, adaptive pins, self-locking fasteners or other hardware for isolating, securing or blocking machines or equipment from energy sources.



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Lockout devices and tagout devices shall be singularly identified with the employee's name; shall be the only devices used for controlling energy; and, shall not be used for other purposes. Employees are responsible to maintain equipment in good condition. The supervisor shall ensure employees use the proper equipment and that it is appropriately applied. A padlock will be issued to each authorized employee and any additional padlock keys will be disposed of.

### E. Lockout/Tagout Procedure and Restoration to Service

The following sections on Lockout/Tagout Procedure and Restoration to Service were taken from OSHA CFR 1910.147. It is intended to provide a general overview of the lockout procedure. Operations that do not need a separate specific lockout/tagout procedure [as defined in 29 CFR 1910.147, Paragraph (c) (4) (i)] may use this procedure. (Appendix C Lockout/Tagout implementation flow chart)

It is anticipated that all Trio Wolf Creek Distance Learning Charter School tagouts will be used to supplement locks, but if equipment is not capable of being locked out and tags are the sole device, the Trio Wolf Creek Distance Learning Charter School must comply with additional requirements listed in 1910.147.

#### 1. Sequence of Lockout

- a. Notify all affected employees that a lockout or tagout system is to be utilized and the reason for doing so. The authorized employee shall know the type of energy that the machine or equipment utilizes and shall understand the hazards associated with the machine as well as the methods or means to control the hazard.
- b. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).
- c. Operate the switch, valve, or other energy isolating device(s) so that the equipment is isolated from its energy source(s). 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., thereby eliminating the potential for re-accumulation of energy.
- d. Lockout each energy source or isolating devices with assigned individual lock(s).
- e. 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 control(s) to "neutral" or "off" position after the test (de-energized state).

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### 2. Procedure Involving Multiple Individuals

- a. If more than one individual is required to lockout or equipment, each shall place his/her own personal lockout device on the energy isolating device(s). When an energy isolating device cannot accept multiple locks, a multiple lockout device (hasp) may be used. A single lock may be used to lockout the machine or equipment with the key being placed in a lockout box or other device which allows the use of multiple locks to secure it. Each employee will then use his/her own lock to secure the box or the device. As each person no longer needs to maintain his or her lockout protection, that person will remove his/her lock from the box or cabinet. The names/titles of employees authorized for group lockout are detailed on the Lockout/Tagout Energy Control Procedure Form (Appendix E) and are included under Section B above.

### 3. Restoring Machines or Equipment to Service

- a. After the servicing and/or maintenance is complete and equipment is ready for normal production operations, check the area around the machine or equipment to ensure that no one is exposed and equipment is safe to operate.
- b. After all tools have been removed from the machine or equipment, guards have been returned to proper position and verify employees are in the clear; each employee shall remove their own lockout device(s). Affected employees shall be notified of the removal of the lockout equipment. Operate the energy isolating devices to restore energy to the machine or equipment.

## F. Equipment Energized by Plug and Cord or Single Energy Source

### 1. Plug and Cord

- a. During service and maintenance operations, all plugs will be controlled with a plug lockout device under the exclusive control of the person performing the service and maintenance activity. (See NOTE below).
- b. Refer to Appendix E Sequence of Lockout/Tagout Procedure.

NOTE: Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup 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 service or maintenance activity, then a. above.

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### G. Training and Periodic Inspection

#### 1. Training

The affected and authorized employee training will consist of the following elements:

- a.. Review of 1910.147 "The Control of Hazardous Energy" (Lockout/Tagout) requirements.
- b. Recognition of the type of energy sources.
- c. Purpose and use of the lockout/tagout procedure
- d. Nature and limitations of tags.
- e. How to isolate and control equipment/machinery for lockout.
- f. Conditions for restarting equipment/machinery or removing tags.

The lockout/tagout awareness training will be given to affected employees as part of orientation. All employees whose work may be affected operations may be in an area where energy control procedures may be utilized shall be instructed about the procedure(s) and about the prohibition relating to attempts to restart or reenergize equipment which has been locked out.

Authorized and affected employees will receive training prior to their initial involvement with any lockout or tagout operation.

Retraining will be given for authorized and affected employees whenever there is a change in job assignment, a change in machines, or equipment or process that presents a new hazard or a change in the Trio Wolf Creek Distance Learning Charter School lockout/tagout procedures. Retraining will also be given whenever the annual inspection identifies a deficiency or necessary change in the procedures.

A list of names and dates of training and designated trainer(s) will be maintained (Appendix F Lockout Training Log)

#### 2. Periodic Inspection

At least once a year an authorized employee or independent designee, who is not involved in the lockout procedures being inspected, will audit the lockout procedures.

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This will be accomplished by 1). reviewing the Energy Control Procedure form with authorized employees; 2). observing the authorized employee performing the actual and complete lockout procedure for at least one machine or piece of equipment, and 3). reviewing each authorized and affected employee's responsibilities under the program being inspected.

This will be certified by the designated authorized employee/inspector on an annual basis. The documentation shall include inspector and employee names, dates of the inspection, and the lockout procedures being reviewed. Deficiencies and inadequacies will be noted as well as the steps taken to correct them. (See Appendix G Lockout Procedure Inspection Log).

### H. Group Lockout/Tagout

When more than one authorized person is involved in a lockout/tagout situation, the following provisions need to be observed.

1. One authorized employee will be designated overall responsibility (and authority) for the lockout/tagout.
2. The lockout/tagout procedures will be reviewed with each group member.
3. If more than one crew or department is involved, a single employee must still be selected as being ultimately responsible for the lockout/tagout.
4. Each authorized employee will affix the lockout device to the group lockout. This device should have the person's name affixed to it. As each authorized employee finishes their work and no longer requires lockout protection, their lockout device can be removed.

### I. Shift or Personnel Changes

Shift changes and personnel changes will be coordinated by the authorized employee in charge of the group or individual lockout. This will include:

- a. Changing locks or tags from off-going to on-coming authorized employees;
- b. Retesting to ensure equipment or machinery being serviced is de-energized; and,
- c. Informing on-coming employees of changes in the job that affects the lockout procedures.

### J. Outside or Contractor Personnel

Outside personnel or contractors involved in operations relating to equipment or machinery lockout that affects the Trio Wolf Creek Distance Learning Charter School employees must either submit their lockout/tagout procedures to the school district or

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fully comply with the school district's Lockout/Tagout procedures. The Trio Wolf Creek Distance Learning Charter School must review and approve the outside contractor's program or require the contractor to comply with the district's program. Affected employees must be trained and notified as outlined in this written program. The district's responsible supervisor for the affected area will ensure that outside personnel and affected employees are informed of the proper procedure and verified by completing Appendix H Outside Contractor Acknowledgement.

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### **Appendix A**

#### **Lockout Program Compliance Checklist**

The following checklist is intended to provide a quick reference for the Trio Wolf Creek Distance Learning Charter School to evaluate their level of compliance with the Minnesota OSHA 5207.0600 and Federal OSHA 29 CFR 1910.147.

- Complete Written Energy Control Inventory
- List of Individual's Responsible for Approving Lockout Procedure Plans
- Lockout Plans distributed and practiced
- Training Program for Staff
- Provisions for Periodic Energy Procedure Plan Inspections
- Training Records maintained in a central location

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### Appendix B Lockout Training Log

School: TRIO Wolf Creek Distance Learning Charter School # 4095

**NOTE:** Chisago Lakes Schools, ISD #2144 Director of Maintenance is responsible for TRIO's Lockout/Tagout procedures, trainings, etc.

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### **Appendix C**

#### **Equipment Inventory Sheet for Lockout**



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### **Appendix C**

#### **Trio Wolf Creek Distance Learning Charter School**

#### **Equipment Inventory Sheet for Lockout**

**The following pieces of equipment have been classified as requiring a Lockout/Tagout Procedure. The appropriate procedures for Lockout/Tagout operations are found on the indicated page(s) of Appendix D attached to this policy.**

#### **Lennox Air Handling Units – Qty 6**

**Cat # - F8691**

**Description # - TGA048S2BS G**

**Location – Rooftop**

**Electrical Control Location – 30 amp GE heavy duty service disconnect mounted on the outside of each unit.**

**Natural Gas Control Location – Ball valve located on the ½ inch gas line located just outside of each unit.**

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### **Appendix D**

#### **Lockout Procedures**

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### APPENDIX D

#### **ELECTRICAL AND NATURAL GAS PROCEDURES FOR AIR HANDLERS LENOX (QTY 6) - ROOFTOP**

- Step 1: NOTIFY all affected employees that a lockout or tagout is going to be used and reasons why.
- Step 2: Authorized employees will turn off GE Heavy Duty service disconnect arms for air handler fan motors. Service disconnects are mounted on the outside of each air handling unit.
- Step 3: Authorized employees will LOCKOUT the service disconnect for the fan motor.
- Step 4: Authorized employees will turn the gas line shutoff ball valve handle to the closed position. This ball valve is located on the ½ inch gas line outside of each air handling unit.
- Step 5: Authorized employees will LOCKOUT the gas shutoff ball valve using the appropriate ball valve lockout device.
- Step 6: An ATTEMPT TO START the equipment will be made after ensuring that no personnel are exposed. Return operating controls to off or neutral. THE EQUIPMENT IS NOW LOCKED OUT.

#### **RELEASE FROM LOCKOUT/TAGOUT (ELECTRICAL AND NATURAL GAS FOR AIR HANDLERS) – LENOX (QTY 6) - ROOFTOP**

Before lockout or tagout devices are removed and energy is restored to the equipment following steps will be taken.

- Step 1: INSPECT work area to ensure components are intact and non-essential items (tools, etc.) have been removed.
- Step 2: Ensure all EMPLOYEES are OUT OF DANGER and notify affected employees of startup.
- Step 3: Each LOCKOUT DEVICE will be REMOVED from the service disconnect and gas shutoff ball valve by the employee who applied the device. (See Exception Section.)
- Step 4: Start the Air Handler.

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### **PLUG AND CORD OR SINGLE ENERGY SOURCE LOCKOUT/TAGOUT PROCEDURES**

Step 1: NOTIFY all affected employees that a lockout or tagout is going to be used and reasons why.

Step 2: Authorized employees will unplug equipment.

Step 3: Authorized employees will place a plug LOCKOUT device on the equipment's power cord.

Step 4: An ATTEMPT TO START the equipment will be made after ensuring that no personnel are exposed. Return operating controls to off or neutral. THE EQUIPMENT IS NOW LOCKED OUT.

### **PLUG AND CORD OR SINGLE ENERGY SOURCE LOCKOUT/TAGOUT RELEASE PROCEDURES**

Before lockout or tagout devices are removed and energy is restored to the equipment following steps will be taken.

Step 1: INSPECT work area to ensure components are intact and non-essential items (tools, etc.) have been removed.

Step 2: Ensure all EMPLOYEES are OUT OF DANGER and notify affected employees of startup.

Step 3: LOCKOUT DEVICE will be REMOVED by the employee who applied the device. (See Exception Section.)

Step 4: Start the equipment.

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**Appendix E**

**Lockout Procedure Inspection Log**

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#### **Lockout Procedure Inspection Log**

**NOTE: Chisago Lakes Schools, ISD #2144 Director of Maintenance is responsible for TRIO's Lockout/Tagout procedures, trainings, inspections etc.**

**Last date of Inspection:** December 13, 2017

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**Appendix F**

**Lockout/Tagout Acknowledgement Form  
(Outside Contractor)**

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### OUTSIDE CONTRACTOR LOCKOUT/TAGOUT PROGRAM ACKNOWLEDGEMENT FORM

Name of Contractor/Firm: \_\_\_\_\_

Trio Wolf Creek Distance Learning Charter School has developed and implemented comprehensive policies and procedures for control of hazardous energy or Lockout/Tagout in accordance with the requirements of OSHA CFR 1910.147. Trio Wolf Creek Distance Learning Charter School requires that outside contractors either agree to work under the requirements of the Trio Wolf Creek Distance Learning Charter School program or the Trio Wolf Creek Distance Learning Charter School has the option of accepting the policies and procedures of the outside contractor.

#### District Acknowledgement:

I have received a copy of the contractor's policies and procedures and determined that it meets the requirements of OSHA CFR 1910.147 Lockout/Tagout policies and procedures.

District Representative: \_\_\_\_\_

Date: \_\_\_\_\_

#### Contractor Acknowledgement:

I have received a copy of the policies and procedures of Trio Wolf Creek Distance Learning Charter School and agree to fully comply with these requirements. All of our employees have been trained in the proper procedures and have the required lockout devices.

Name of Contractor: \_\_\_\_\_

Contractor Representative: \_\_\_\_\_

Date: \_\_\_\_\_



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**Appendix G**

**The Control of Hazardous Energy  
(Lockout/Tagout)  
Federal OSHA CFR 1910.147**

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### The control of hazardous energy (lockout/tagout). - 1910.147

- Part Number: 1910
- Part Title: Occupational Safety and Health Standards
- Subpart: J
- Subpart Title: General Environmental Controls
- Standard Number: 1910.147
- Title: The control of hazardous energy (lockout/tagout).

1910.147(a)

Scope, application and purpose -

1910.147(a)(1)

Scope

1910.147(a)(1)(i)

This standard covers the servicing and maintenance of machines and equipment in which the unexpected energization or startup of the machines or equipment, or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

1910.147(a)(1)(ii)

This standard does not cover the following:

1910.147(a)(1)(ii)(A)

Construction, agriculture and maritime employment;

1910.147(a)(1)(ii)(B)

Installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication or metering; and

1910.147(a)(1)(ii)(C)

Exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations, which is covered by Subpart S of this part; and

..1910.147(a)(1)(ii)(D)

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1910.147(a)(1)(ii)(D)

Oil and gas well drilling and servicing.

1910.147(a)(2)

Application.

1910.147(a)(2)(i)

This standard applies to the control of energy during servicing and/or maintenance of machines and equipment.

1910.147(a)(2)(ii)

Normal production operations are not covered by this standard (See Subpart O of this Part). Servicing and/or maintenance which take place during normal production operations are covered by this standard only if:

1910.147(a)(2)(ii)(A)

An employee is required to remove or bypass a guard or other safety device; or

1910.147(a)(2)(ii)(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: Exception to paragraph (a)(2)(ii): Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard 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 (See Subpart O of this Part).

1910.147(a)(2)(iii)

This standard does not apply to the following:

..1910.147(a)(2)(iii)(A)

1910.147(a)(2)(iii)(A)

Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup 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.

1910.147(a)(2)(iii)(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-

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1910.147(a)(2)(iii)(B)(1)  
continuity of service is essential;

1910.147(a)(2)(iii)(B)(2)  
shutdown of the system is impractical; and

1910.147(a)(2)(iii)(B)(3)  
documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

1910.147(a)(3)  
Purpose.

1910.147(a)(3)(i)  
This section requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start up or release of stored energy in order to prevent injury to employees.

1910.147(a)(3)(ii)  
When other standards in this part require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this section.

1910.147(b)  
Definitions applicable to this section.

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

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

Capable of being locked out. An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized. Connected to an energy source or containing residual or stored energy.

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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. 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.

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.

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. 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.

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

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.

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

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.

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

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procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

..1910.147(c)

1910.147(c)  
General -

1910.147(c)(1)

Energy control program. The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing 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.

1910.147(c)(2)

Lockout/tagout.

1910.147(c)(2)(i)

If an energy isolating device is not capable of being locked out, the employer's energy control program under paragraph (c)(1) of this section shall utilize a tagout system.

1910.147(c)(2)(ii)

If an energy isolating device is capable of being locked out, the employer's energy control program under paragraph (c)(1) of this section shall utilize lockout, unless the employer can demonstrate that the utilization of a tagout system will provide full employee protection as set forth in paragraph (c)(3) of this section.

1910.147(c)(2)(iii)

After January 2, 1990, whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.

1910.147(c)(3)

Full employee protection.

1910.147(c)(3)(i)

When a tagout device is used on an energy isolating device which is capable of being locked out, 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.

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..1910.147(c)(3)(ii)

1910.147(c)(3)(ii)

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 employer 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.

1910.147(c)(4)

Energy control procedure.

1910.147(c)(4)(i)

Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.

Note: Exception: The employer need not document the required procedure for a particular machine or equipment, 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 lockout 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; and (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.

1910.147(c)(4)(ii)

The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

1910.147(c)(4)(ii)(A)

A specific statement of the intended use of the procedure;

1910.147(c)(4)(ii)(B)

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Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;

1910.147(c)(4)(ii)(C)

Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and

..1910.147(c)(4)(ii)(D)

1910.147(c)(4)(ii)(D)

Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

1910.147(c)(5)

Protective materials and hardware.

1910.147(c)(5)(i)

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

1910.147(c)(5)(ii)

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

1910.147(c)(5)(ii)(A)

Durable.

1910.147(c)(5)(ii)(A)(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.

1910.147(c)(5)(ii)(A)(2)

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

1910.147(c)(5)(ii)(A)(3)

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

..1910.147(c)(5)(ii)(B)



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1910.147(c)(5)(ii)(B)

Standardized. Lockout and tagout devices shall be standardized within the facility 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.

1910.147(c)(5)(ii)(C)

Substantial -

1910.147(c)(5)(ii)(C)(1)

Lockout devices. 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.

1910.147(c)(5)(ii)(C)(2)

Tagout devices. 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-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.

1910.147(c)(5)(ii)(D)

Identifiable. Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

1910.147(c)(5)(iii)

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.

..1910.147(c)(6)

1910.147(c)(6)

Periodic inspection.

1910.147(c)(6)(i)

The employer 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.

1910.147(c)(6)(i)(A)

The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

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1910.147(c)(6)(i)(B)

The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

1910.147(c)(6)(i)(C)

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

1910.147(c)(6)(i)(D)

Where tagout is used for energy control, the periodic inspection shall 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 the elements set forth in paragraph (c)(7)(ii) of this section.

..1910.147(c)(6)(ii)

1910.147(c)(6)(ii)

The employer 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.

1910.147(c)(7)

Training and communication.

1910.147(c)(7)(i)

The employer 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:

1910.147(c)(7)(i)(A)

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.

1910.147(c)(7)(i)(B)

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

1910.147(c)(7)(i)(C)

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

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relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

1910.147(c)(7)(ii)

When tagout systems are used, employees shall also be trained in the following limitations of tags:

..1910.147(c)(7)(ii)(A)

1910.147(c)(7)(ii)(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.

1910.147(c)(7)(ii)(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.

1910.147(c)(7)(ii)(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.

1910.147(c)(7)(ii)(D)

Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

1910.147(c)(7)(ii)(E)

Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

1910.147(c)(7)(ii)(F)

Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

1910.147(c)(7)(iii)

Employee retraining.

..1910.147(c)(7)(iii)(A)

1910.147(c)(7)(iii)(A)

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Retraining shall 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.

### 1910.147(c)(7)(iii)(B)

Additional retraining shall also be conducted whenever a periodic inspection under paragraph (c)(6) of this section 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.

### 1910.147(c)(7)(iii)(C)

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

### 1910.147(c)(7)(iv)

The employer 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.

### 1910.147(c)(8)

Energy isolation. Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

### 1910.147(c)(9)

Notification of employees. Affected employees shall be notified by the employer or authorized employee 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.

### ..1910.147(d)

### 1910.147(d)

Application of control. The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

### 1910.147(d)(1)

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.

### 1910.147(d)(2)

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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 hazard(s) to employees as a result of the equipment stoppage.

### 1910.147(d)(3)

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 source(s).

### 1910.147(d)(4)

Lockout or tagout device application.

#### 1910.147(d)(4)(i)

Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

#### ..1910.147(d)(4)(ii)

#### 1910.147(d)(4)(ii)

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

#### 1910.147(d)(4)(iii)

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.

#### 1910.147(d)(4)(iii)(A)

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

#### 1910.147(d)(4)(iii)(B)

Where a tag cannot be affixed directly to the energy isolating device, the tag shall 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.

### 1910.147(d)(5)

Stored energy.

#### 1910.147(d)(5)(i)

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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.

..1910.147(d)(5)(ii)

1910.147(d)(5)(ii)

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

1910.147(d)(6)

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 deenergization of the machine or equipment have been accomplished.

1910.147(e)

Release from lockout or tagout. 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:

1910.147(e)(1)

The machine or equipment. 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.

1910.147(e)(2)

Employees.

1910.147(e)(2)(i)

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

1910.147(e)(2)(ii)

After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

1910.147(e)(3)

Lockout or tagout devices removal. Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. Exception to paragraph (e)(3): 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

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incorporated into the employer's energy control program. The employer shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

1910.147(e)(3)(i)

Verification by the employer that the authorized employee who applied the device is not at the facility:

1910.147(e)(3)(ii)

Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and

1910.147(e)(3)(iii)

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

..1910.147(f)

1910.147(f)

Additional requirements.

1910.147(f)(1)

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 sequence of actions shall be followed:

1910.147(f)(1)(i)

Clear the machine or equipment of tools and materials in accordance with paragraph (e)(1) of this section;

1910.147(f)(1)(ii)

Remove employees from the machine or equipment area in accordance with paragraph (e)(2) of this section;

1910.147(f)(1)(iii)

Remove the lockout or tagout devices as specified in paragraph (e)(3) of this section;

1910.147(f)(1)(iv)

Energize and proceed with testing or positioning;

1910.147(f)(1)(v)

Deenergize all systems and reapply energy control measures in accordance with paragraph (d) of this section to continue the servicing and/or maintenance.

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1910.147(f)(2)

Outside personnel (contractors, etc.).

1910.147(f)(2)(i)

Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site employer and the outside employer shall inform each other of their respective lockout or tagout procedures.

..1910.147(f)(2)(ii)

1910.147(f)(2)(ii)

The on-site employer shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

1910.147(f)(3)

Group lockout or tagout.

1910.147(f)(3)(i)

When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall 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.

1910.147(f)(3)(ii)

Group lockout or tagout devices shall be used in accordance with the procedures required by paragraph (c)(4) of this section including, but not necessarily limited to, the following specific requirements:

1910.147(f)(3)(ii)(A)

Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock);

1910.147(f)(3)(ii)(B)

Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment and

1910.147(f)(3)(ii)(C)

When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and

..1910.147(f)(3)(ii)(D)

1910.147(f)(3)(ii)(D)



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Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

1910.147(f)(4)

Shift or personnel changes. Specific procedures shall 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 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.

Note: The following appendix to §1910.147 services as a non-mandatory guideline to assist employers and employees in complying with the requirements of this section, as well as to provide other helpful information. Nothing in the appendix adds to or detracts from any of the requirements of this section.

[54 FR 36687, Sept. 1, 1989, as amended at 54 FR 42498, Oct. 17, 1989; 55 FR 38685, 38686, Sept. 20, 1990; 61 FR 5507, Feb. 13, 1996]