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## **Purpose**

The purpose of this program is to establish procedures for affixing appropriate lockout/tagout equipment to energy isolating devices and to otherwise disable machines or equipment to prevent unexpected energization, start up or release of stored energy to prevent injury or incident.

## **Scope**

This program covers the servicing and maintenance of machines and equipment where the unexpected energization or start up of the machine or equipment, or the release of stored energy could cause an incident. This program establishes minimum performance requirements for the control of such hazardous energy. When work is performed on a nonowned or operated site, the operator's program shall take precedence, however, this document covers CARDINAL SURVEYS COMPANY employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

## **Definitions**

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

**Authorized employee** - A person that performs lockout/tagout procedures on machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes authorized when that employee's duties include performing servicing or maintenance covered under this program.


**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.

**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 and 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 isolating devices.

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

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Hot tap - A procedure used in the repair, maintenance and service activities that involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or other appurtenances.

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 either a key or combination type lock, 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 operation - The utilization of a machine or equipment to perform its intended operation.

Servicing and/or maintenance - Workplace activities such as constructing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines and equipment, where the employee may be exposed to an unexpected energization or startup of the equipment or release of a hazardous energy source.

Setting up - Any work performed to prepare a machine or equipment for performing 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.

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 tagout device is removed.

## Key Responsibilities


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### Managers and Supervisors

- Responsible to control and enforce this plan and to see that all their employees and contractors that are affected by lockout/tagout procedures, have the knowledge and understanding required for safe application, usage, and removal of all energy controls and devices.
- Ensure employees are trained and comply with the requirements of this program.

### Employees

- Employees who are affected by this program are required to attend training on an annual basis.
- Are required to follow the provisions of this program.

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## Procedure

### General

Only an authorized employee or employees performing the servicing or maintenance shall perform lockout or tagout.

### Devices

**Lockout Device** - If an energy source can be locked out a device that utilizes a lock to hold an energy isolating device in a safe position shall be used. Each site shall have the same type of lock as specified by CARDINAL SURVEYS COMPANY.

**Tagout Device** – If an energy source cannot be locked out with a lockout device then a tagout device shall be used. Tagout devices are a warning only level of protection and shall be weather and chemical resistant, standardized in color with clear written warning of hazardous energy; i.e. Do Not Operate, Do Not Start, Do Not Energize, etc. Each site shall have the same style of tags specified by CARDINAL SURVEYS COMPANY.

### Specific Energy Control Procedures


Each manager or supervisor is responsible for developing specific step-by-step shutdown and startup procedures for a particular machine or piece of equipment in their respective area.

- A written, step-by-step isolation procedure for shutdown and startup shall be prepared for each type of machine or piece of equipment.
- This procedure shall include:
  - Equipment number if assigned.
  - Equipment location.
  - Energy Source(s) (i.e. electrical, hydraulic, gas pressure, etc.)
  - Location of isolating controls (i.e. breaker switches, valves, etc.)
  - Quantity of isolating controls
  - Quantity of locks required to isolate the equipment
  - Other hardware required to isolate the equipment (i.e. chains, valve covers, blocks, etc.)
  - List any residual energy required to be dissipated before work begins.

### Specific Sequence for Application of Energy Control

#### 1. Notification

Authorized employees must notify all other affected employees of the application and removal of lockout/tagout devices. Notification shall be given before the controls are applied and before they are removed from the machine or equipment.

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**2. Preparation for Shutdown**

Before an authorized or affected employee shuts down a machine or equipment, the authorized employee shall have the knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means (locks) to control the energy sources.

**3. Machine or Equipment Shutdown**

The machine or equipment shall be shut down using the procedures established for that machine or piece of equipment. The shutdown shall be orderly to avoid any addition hazards to employees as a result of the stoppage.

**4. 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).

**5. Lockout/Tagout Devices and Application**

- Each authorized employee shall have the proper number of locks and devices to be able to perform proper lockout/tagout procedures for machines or equipment that they may be working on.
- Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.
- Each lockout and tagout devices shall include the name of the individual placing the device.
- Lockout devices shall be affixed in a manner to hold the energy isolating devices in a safe or off position.
- Tagout devices shall be affixed in a manner that will clearly indicate that the operation or movement of isolating devices from the safe or off position.
- Tagout devices used with energy isolating devices with the capability of being locked out shall be fastened at the same point at which the lock would have been attached. If a tag cannot be directly attached to the energy isolation device it shall be located as close as safely as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.
- Each energy source shall be locked out completely isolating the equipment.
- Isolating machines or equipment shall include, but are not limited to:
  - Pumps, compressors, generators, electric distribution, storage tanks, etc.
  - Each type of equipment to be isolated shall have specific procedures for isolation, i.e. for compressors: suction, discharge, power, starting, fuel, dumps shall be closed, locked and tagged out properly. The blow-down valve shall be opened, locked and tagged out properly. (NOTE): If compressor has a side stream hooked up, the side stream shall be closed, locked and tagged out properly.

**6. Stored Energy and the Possibility of Reaccumulation**

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.

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If there is a possibility of re-accumulation of stored energy, verification of isolation shall be continued until the servicing or maintenance operation is completed, or until the possibility of such accumulation no longer exists.

*7. Verification of Isolation*

The authorized employees performing the lockout procedure verifies/ensures that the equipment is isolated or disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the machine or equipment by operating the control(s) or by testing to make certain the equipment will not operate.

**Multiple Workers**

A crew of authorized employees may use a group lockout or tagout device. This will afford the group of employees a level of protection equal to that provided by a personal lockout or tagout device.

- A tailgate meeting shall be conducted to review the lockout procedures and other information as required for safe work to continue – all crafts and effected departments shall be involved.
- An authorized employee will isolate the equipment and ascertain the exposure status of individual group members.
- All workers will then place their individual locks on the device's group lockout or tagout device after they have verified the procedure.
- The crew leader or an assigned authorized employee shall be responsible of assuring the continuity of the lockout procedures including documenting lockout information passed along during a shift or personnel changes.

**Release from Lockout/Tagout**


When servicing or maintenance is completed or when Lockout / Tagout devices must be temporarily removed, the equipment requires testing and the machine or equipment is ready for testing or to return to normal operating conditions, the following steps shall be taken, in this order:

- Check the machine or equipment and the immediate area surrounding the machine or equipment to ensure that all nonessential items such as tools have been removed and that the machine or equipment components are operationally intact.
- Check the work area to ensure that all personnel have been safely positioned or removed from the area.
- Remove the Lockout/Tagout device
- Energize and proceed with testing
- Deenergize and reapply control methods including Lockout / Tagout devices
- Document the procedure by use of the completed isolation log and provide to supervisor for filing.

**Removal of Locks**

The authorized employee who applied the lock shall be the one to remove their lock. However, after all work has been completed, certain conditions may arise which prohibit this person from being present to remove the lock.

The following procedures shall be followed to allow for the removal of a lock that another person has applied:

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- Every effort shall be made to contact the authorized employee who applied the lock to obtain the key(s).
- If the key(s) cannot be made available, the employee who requests removal of the lock shall contact their supervisor.
- The supervisor shall verify that every effort was made to contact the original authorized employee who applied the lock and to obtain the key(s).
- The employee removing the lock shall note on the Service Report that the lock(s) were removed with permission by supervisor.
- All reasonable efforts will be made by supervisor to notify that employee their lock has been removed, ensuring that the authorized employee has this knowledge before they return to work.
- If the equipment is client owned, the supervisor or employee requesting to remove the lock(s) shall contact the client to get the lock removed. Clients must remove their lock(s).
- NOTE: CARDINAL SURVEYS COMPANY employees shall not remove any client locks.

### Shift or Personnel Changes

In the event shift or personnel changes occur during maintenance and/or repair activities, the designated CARDINAL SURVEYS COMPANY employee in charge shall take the necessary steps to maintain the continuity of the lockout/tagout protection. This includes maintaining that all provisions in this procedure are adhered to and the transfer of lockout/tagout devices between authorized employees is accomplished.

### Contractors

Contractors performing lockout procedures on CARDINAL SURVEYS COMPANY property shall comply with this procedure. Contractors shall supply their own locks.

CARDINAL SURVEYS COMPANY shall initially lockout CARDINAL SURVEYS COMPANY machines and equipment before the contractor will be allowed to apply their own lock in addition to the CARDINAL SURVEYS COMPANY's.


### Annual Audits

Each year the manager or supervisor, or his representative, will perform an inspection of the Lockout Program in their respective areas to verify the effectiveness of the program. An authorized employee other than the one(s) utilizing the energy control procedure being inspected shall perform the audit and shall verify that:

- Each authorized and/or affected employee has been trained as required.
- Any new equipment added has specific lockout procedures developed and documented.
- Current procedures are adequate for performing complete isolation of equipment and resulting in a zero energy state.
- The annual audit will be certified in writing and a copy of the audit maintained on file at the managers/supervisors office.

### TRAINING

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CARDINAL SURVEYS COMPANY shall provide training to ensure that the purpose and function of the energy control program are understood by authorized 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:

- The recognition of applicable hazardous energy (lockout/tagout) sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.
- The purpose and use of energy control procedures.
- When tagout systems are used, employees shall also be trained in the following limitations of tags:
  - 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.
  - 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.
  - 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.
  - Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
  - Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.
  - Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

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 reenergize machines or equipment which are locked out or tagged out.

*Retraining*


Retraining shall be conducted whenever a periodic inspection reveals, or whenever CARDINAL SURVEYS COMPANY has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

Retraining is also required when there is a change in job assignments, in machines, a change in the energy control procedures or a new hazard is introduced.

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

*Training Documentation*

CARDINAL SURVEYS COMPANY shall certify that employee training has been accomplished and is being kept up to date. All training and/or retraining must be documented, signed and certified.

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### SPECIFIC EQUIPMENT LOCKOUT PROCEDURES

Department \_\_\_\_\_

Equipment No. \_\_\_\_\_

Energy Source \_\_\_\_\_

Procedure for Shutdown and Isolation:

(List number of steps required to isolate machine or equipment - write N/A on lines not used or add additional steps if necessary)

STEP NO.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_


Additional Information: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_

(This procedure to be communicated to all authorized and affected employees and kept on file at location of machine or equipment)



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**SAMPLE TAG**

# WARNING


## MINIMUM LOCK/OUT – TAG/OUT PROCEDURES

Inlet Suction Block Valve Discharge Block Valve  
 Fuel Gas Valve Start Gas Valve  
 Liquid Dump Line Blow Down (Lock Open)

When working on this compressor package the following items must be **LOCKED OUT & TAGGED OUT**. Residual pressure must be blown down. Open all valves on surge bottles and piping to relieve any pressure that may be trapped.

### Side Stream (For Units Set up with Side Streams)

When working on the compressor each person must lock and tag the compressor package!

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## ISOLATION LOG

Date of Isolation:

Description of Work:

List of Equipment out of Service:

Necessary Requirements of Clear Isolation:


Authorized Employee Signature: \_\_\_\_\_

Person Continuing Work Signature: \_\_\_\_\_

### Locks/Tags for GROUP LOCKOUT or Multiple Locks/Tags

Lock # or Tag	Date Installed	Date Removed	Print Name (for Group Lockout)	Signature

(If additional space is needed, please attach an additional page)

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## ANNUAL AUDIT OF THE CONTROL OF HAZARDOUS ENERGY PROGRAM

I certify that an audit of the CARDINAL SURVEYS COMPANY "Control of Hazardous Energy" Program was conducted and that each employee has been trained in the recognition and procedures to lockout equipment they may be required to work on or may be affected by.

I further acknowledge that the current procedure is adequate to safely lockout equipment in this department for servicing and maintenance.

Department: \_\_\_\_\_

Manager (or representative): \_\_\_\_\_

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

Original to file: \_\_\_\_\_