Training Record

LOCATION NAME	PHYSICAL ADDRESS	NEARTEST CITY	STATE	ZIP

	PRINTED NAME (include company name if subcontractor) **NOMBRE EN LETRA IMPRENTA** (si es subcontratista, incluya el nombre de la compañía)	*Signature / Firma*
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

use p.2 for additional participants

Check the following to indicate completion and identify any other activities or resources used or referenced.

- ☐ *Communicated the contents of this program and any applicable regulations and where and how to access both.*
- ☐ *Administered the training quiz (attached if completed individually).*
- ☐ *Identified lock/tag standardization characteristics for facility.*
- ☐ *Demonstrated common LOTO devices (locks, hasps, valve covers, group box, etc).*
- ☐ *Reviewed at least three equipment-specific LOTO procedures.*
- ☐ *Performed at least one LOTO procedure, making sure to include verification (try-out) step.*
- ☐
- ☐
- ☐
- ☐

SUPERVISOR/FACILITATOR'S NAME *Signature* **DATE**

	PRINTED NAME (include company name if subcontractor) **NOMBRE EN LETRA IMPRENTA** (si es subcontratista, incluya el nombre de la compañía)	*Signature / Firma*
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		

Workers can typically see the effects of energy, especially energy in motion, or kinetic energy: *a moving conveyor, a pressure gage, a gas burner, etc.*

There is also stored energy, or potential energy, that is not yet creating visible activity. Potential energy is harder to detect and its effect is more difficult to predict, especially in the event of an unexpected and uncontrolled release: *the current contained in an energized electrical circuit; steam held back behind a shut-off valve; a vehicle propped up on a jack stand; etc.*

The purpose of this program is effective isolation of energy, whether it can be seen in motion or not and regardless of its source (electrical, mechanical, hydraulic, gravitational, thermal, etc.), and to give each authorized worker individual control over the isolation. In 29 CFR 1926, OSHA's construction safety standards, there are several references to energy isolation procedures for certain types of equipment and activities. In 29 CFR 1910.147, the general industry standard for the control of hazardous energy (lockout/tagout), which is often referred to as LOTO, the scope is much broader and the regulations for energy isolation apply in most situations.

In 1910.147, locks that meet certain specifications are required for securing the means of isolation. In limited circumstances, instead of a lock, a tag that meets certain specifications may be used in conjunction with an established procedure as a *warning* not to operate a piece of equipment until the tag is removed by its owner. In practice, locks and tags are often used together, with the tag serving as a warning and also as a means of owner identification. Whether by tag or some other means, a lock must identify its owner. Lock and tag specifications and applications are explained further in this program.

Hazards must be controlled before maintenance or repair work begins. This includes electrical power, gas lines, process piping, flowable material chutes/conduits, portable equipment (compressors, generators, mixers, screeds, pumps, etc.), and also heavy equipment/machinery/vehicles and their components that can create a hazard by moving, rotating or falling. Whether our work is within the scope of the construction or general industry regulations, it is always our company's policy to effectively isolate and control potentially hazardous energy. This includes:

1. Ensuring that each worker who is exposed to the hazard has individual control over the energy isolation; and
2. Testing the machine or equipment to determine and verify the effectiveness of the isolation measures. In fact, LOTO is better described as LOCKOUT/TAGOUT/**TRYOUT**.

It is also important to note that the equipment subject to repair or maintenance often belongs to the facility in which we have been hired to work. Specific LOTO procedures for a particular machine or piece of equipment should be available for us to follow. A letter of interpretation regarding host employer (i.e. the project or facility owner) responsibilities is included for reference.

Much of this program is written to facilitate compliance with 1910.147, but it is also useful for compliance with the construction standards, where energy isolation is addressed separately in several regulations, including Subpart K Electrical, Subpart O Motor Vehicles, and Subpart Q Concrete and Masonry:

- Electrical controls that are to be deactivated during the course of work on energized or deenergized equipment or circuits must be tagged. Equipment or circuits that are deenergized must be rendered inoperative and must have tags attached at all points where such equipment or circuits can be energized. Tags must be placed to identify plainly the equipment or circuits being worked on.
- Electrical distribution and transmission lines must be deenergized and visibly grounded at the point of work; or, insulating barriers that not a part of or an attachment to the equipment or machinery have been erected to prevent physical contact with the lines; or, clearances must be maintained per the requirements in 29 CFR 1926.550(a)(15).
- Heavy machinery, equipment, or parts thereof, which are suspended or held aloft by use of slings, hoists, or jacks must be substantially blocked or cribbed to prevent falling or shifting before employees are permitted to work under or between them. Bulldozer and scraper blades, end-loader buckets, dump bodies, and similar equipment, must be either fully lowered or blocked when being repaired or when not in use. All controls must be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.
- Whenever the equipment is parked, the parking brake must be set.
- Equipment parked on inclines must have the wheels chocked and the parking brake set.
- Trucks with dump bodies must be equipped with positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.
- Operating levers controlling hoisting or dumping devices on haulage bodies must be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.
- No employee is permitted to perform maintenance or repair activity on equipment (such as compressors mixers, screens or pumps used for concrete and masonry construction activities) where the inadvertent operation of the equipment could occur and cause injury, unless all potentially hazardous energy sources have been locked out and tagged.

DEFINITIONS

Affected employee. An employee whose job requires operation or use of a machine or equipment on which servicing or maintenance is being performed under lock-out or tag-out, or whose job requires work in an area where 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.

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 lock-out 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 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. Electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap. A procedure used in the repair, maintenance and servicing that involves welding or cutting on a piping, tanks, pressure vessels, etc., in order to install connections or appurtenances without the interruption of service.

Lock-out. The placement of a lock-out 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 lock-out device is removed.

Lock-out device. A device that utilizes a positive means, such as a 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 production operations. The utilization of a machine or equipment to perform its intended production function.

Servicing/maintenance. Activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These lubrication, cleaning or un-jamming and making adjustments or tool changes where the employee may be exposed to the unexpected energizing or energy release.

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

Tag-out. The placement of a tag on an energy-isolating device to indicate that the equipment being controlled may not be operated until the device is removed according to procedure.

Tag-out device. A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy-isolating device.

EMPLOYEE TRAINING

Employees who may be exposed to energy source hazards, or who may be required to work in areas where energy control procedures are being used, must be trained in the purpose and function of the company's energy control procedures. The training must include the following:

1. Each authorized employee must 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. Affected employees must be instructed in the purpose and use of the specific energy control procedure that will be used for their protection and the protection of others.
3. All other employees whose work operations are or may be in an area where energy control procedures may be utilized must be informed of the procedures and of prohibitions against restarts and/or tampering with locks and tags.
4. When tag-out systems are used, employees must also be trained in the following limitations of tags:
    - **a.** Tags are essentially warning devices affixed to energy-isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
    - **b.** When a tag is attached to an energy-isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
    - **c.** Tags must be legible and understandable to all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
    - **d.** Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
    - **e.** Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
    - **f.** Tags must be securely attached to energy-isolating devices so that they cannot be inadvertently or accidentally detached during use.

Employee **retraining** must be provided as necessary to reestablish employee proficiency and introduce new or revised control methods and procedures, and must always be provided whenever:

1. Authorized or affected employees experience a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or a change in the energy control procedures.
2. A periodic inspection reveals, or whenever the there is reason to believe, that there are deviations from or inadequacies in an employee's knowledge or use of the energy control procedures.

The employer must certify that employee training has been accomplished and is being kept up to date. The **certification** must contain each employee's name and dates of training.

ENERGY CONTROL PROCEDURES

Before work begins on a project involving a machine or piece of equipment at a job site, the customer's lock-out/tag-out procedures for that particular unit must be reviewed and evaluated to help ensure compliance with our safety practices. Supervisors will then coordinate the energy isolation procedures with the customer. OSHA has issued a letter of interpretation regarding the roles of the "host" employer and the "contract" employer as they relate to controlling hazardous energy sources. This letter is included in this program.

Any existing or potential energy source must be evaluated. Methods and procedures for controlling the energy must be identified, documented and implemented. These include, but are not necessarily limited to, air testing and monitoring, ventilation, personal protective equipment, and lock-out or tag-out of the energy sources.

Locks and tags are often used together. However, there may be rare occurrences in which the required evaluation identifies the use of tags as the better or only option for a particular situation. In these instances, approval must be granted by the supervisor and the specifications for the safe use of tags must be followed.

Lock-out or tag-out may be performed only by the authorized employees who are performing the servicing or maintenance.

Affected employees must be notified by the supervisor or authorized employee of the application and removal of lock-out devices or tag-out devices. Notification must be given before the controls are applied, and after they are removed from the machine or equipment.

Protective Materials and Hardware

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

2. Lock-out devices and tag-out devices must be singularly identified; must be the only devices(s) used for controlling energy; must not be used for other purposes; and must meet the following requirements:

a. Lock-out and tag-out devices must be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

b. Tag-out devices must 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.

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

d. Lock-out and tag-out devices must be standardized within the facility in at least one of the following criteria: color; shape; or size; and additionally, in the case of tag-out devices, print and format must be standardized.

e. Lock-out devices must 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.

f. Tag-out devices, including their means of attachment, must be substantial enough to prevent inadvertent or accidental removal. Tag-out device attachment means must 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.

g. Lock-out and tag-out devices must indicate the identity of the employee applying the device(s).

h. Tag-out devices must warn against hazardous conditions if the machine or equipment is energized and must include a legend such as the following: Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate.

The Established Procedures for the Application of Energy Control (determined in coordination with the customer) must cover the following elements and actions, and must be done in the following sequence:

1. Preparation for shutdown. Before an authorized or affected employee turns off a machine or equipment, the authorized employee must have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

2. Machine or equipment shutdown. The machine or equipment must 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.

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

4. Lock-out or tag-out device application.

a. Lock-out or tag-out devices must be affixed to each energy-isolating device by authorized employees.

b. Lock-out devices, where used, must be affixed in a manner to that will hold the energy-isolating devices in a "safe" or "off" position.

c. Tag-out devices, where used, must 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.

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

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

5. Stored energy.

a. Following the application of lock-out or tag-out devices to energy-isolating devices, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.

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

6. Verification of isolation. Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee must verify that isolation and de-energizing of the machine or equipment have been accomplished.

7. Release from lock-out or tag-out. Before lock-out or tag-out devices are removed and energy is restored to the machine or equipment, procedures must be followed and actions taken by the authorized employee(s) to ensure the following:

a. The work area must be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

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

c. After lock-out or tag-out devices have been removed and before a machine or equipment is started, affected employees must be notified that the lock-out or tag-out device(s) have been removed.

8. Lock-out or tag-out devices removal. Each lock-out or tag-out device must be removed from each energy-isolating device by the employee who applied the device.

Additional Requirements

1. Testing or positioning of machines, equipment or components thereof - In situations where lock-out or tag-out devices must be temporarily removed from the energy-isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions must be followed:

a. Clear the machine or equipment of tools and materials according to procedure;

b. Safely remove employees from the machine or equipment area;

c. Safely remove the lock-out or tag-out devices;

d. Energize and proceed with testing or positioning;

e. De-energize all systems and reapply energy control measures.

2. Group lock-out or tag-out - When servicing and/or maintenance is performed by a crew, craft, department or other group, they must utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lock-out or tag-out device including, but not necessarily limited to, the following specific requirements:

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

b. Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lock-out or tag-out of the machine or equipment; and

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

d. Each authorized employee must affix a personal lock-out or tag-out device to the group lock-out device, group lockbox, or comparable mechanism when he or she begins work, and must remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

3. Shift or personnel changes - Specific procedures must be utilized during shift or personnel changes to ensure the continuity of lock-out or tag-out protection, including provision for the orderly transfer of lock-out or tag-out device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energizing or start-up of the machine or equipment, or the release of stored energy.

LINE BREAKS

While the 1910.147 standard does allow "hot taps", which involves welding or cutting on a piping, tanks, pressure vessels, etc., in order to avoid the interruption of service, many piping situations can be effectively de-energized. Line breaks are referenced specifically in the Process Safety Management regulations for highly hazardous chemicals but, regardless of the liquid or gas that may be present, potentially harmful energy sources should be isolated.

1. The flow can be shut off by:
    a. Valve closure
    b. Blocking with a line blank, or "skillet"
    c. Crimping or "squeezing off" the line (e.g. with polyethelene pipe)
    d. Disconnecting the pipe or hose
2. Either of these three mechanisms must be locked out and tagged ensure the energy remains isolated.
3. The line downstream from the locked out flow must be drained or bled of pressure before work begins.
4. In situations where a hazardous atmosphere may be created by the contents or their vapors, additional ventilation must be provided and the air must be monitored with a calibrated detector.
5. If the atmosphere is flammable, care must be taken to ensure that appropriate equipment is used (e.g. an air blower designed with an explosion proof motor housing).
6. Additional PPE is often required due to the flowable contents, which are sometimes under pressure. These requirements must be identified before work begins. Always consult the Safety Data Sheet (SDS).

PERIODIC INSPECTION

Under the general industry standard, OSHA requires an annual inspection of our energy control procedures for the various types of operations that we perform. Since step by step procedures for the specific pieces of equipment that we work on are typically developed and maintained by the customer, it is our policy to cooperate with the customer during their annual inspections if we are on site at that time.

When procedures for our customer's equipment are not in place we may, instead, conduct an annual inspection according to the general groupings of the types of equipment for which we offer services. The owner or his designee may inspect energy control procedures related to these general groupings and any deviations will be corrected or any necessary modifications to the procedures will be made.

Where lock-out is used for energy control, the periodic inspection must include a review, between the owner's designee and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

Where tag-out is used for energy control, the periodic inspection must include a review, between the owner's designee and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the training requirements related to the proper use of tags.

The owner's designee will certify that the periodic inspections have been performed. The certification must identify the equipment grouping for which the energy control procedures apply, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

FORMS

The following pages include our template for equipment-specific LOTO procedures, the annual inspection form, and a sample LOTO checklist and line break permit, which may be useful in certain situations in our customers' facilities.

BLANK

Equipment-Specific LOTO Procedure Originated on: YYYY-MM-DD

EQUIPMENT IDENTIFICATION

PHOTO

IDENTIFY/DESCRIBE

Locks/Tags Needed

IDENTIFY/DESCRIBE ADDITIONAL LOTO DEVICES NEEDED

PREPARATION / SHUTDOWN STEPS

PHOTO

ISOLATION / DEVICE APPLICATION / VERIFICATION STEPS

PHOTO

TESTING / RE-START STEPS

PHOTO

Annual Periodic Inspection Certificate

Equipment Description	Inspection Date	CHECK COLUMNS THAT APPLY Lockout/tagout procedure reviewed with authorized employee(s)	Tagout only/ 1910.147(c)(7)(ii) reviewed with authorized employee(s)	Deviations or inadequacies identified and corrected

EMPLOYEES INCLUDED IN THE INSPECTION

Authorized Person for annual LOTO inspection *Signature*

ENERGY ISOLATION (LOCK-OUT/TAG-OUT) CHECKLIST

WORKSITE	EQUIPMENT	JOB DESCRIPTION

AUTHORIZED PERSONNEL		

AFFECTED PERSONNEL

INITIAL PROCEDURES	NA✓	VERIFIED✓

1 All authorized and affected personnel have received appropriate training

2 All authorized personnel have been assigned necessary locks/tags for individual use

3 Each authorized person understands that each energy source must be controlled by his/her individually assigned lock(s)/tag(s)

4 Equipment owners have worked with authorized persons to identify all energy sources, have provided instruction in equipment-specific lock-out procedures, and have approved the de-energization

ELECTRICAL PROCEDURES		

1 All power sources disconnected

2 Each disconnect locked/tagged out

3 Each authorized person controls each energy source with personally assigned lock(s)

4 Each authorized person has visually verified lock out

5 Each authorized person has physically tested power start to verify de-energization

HYDRAULIC/PNEUMATIC LINE PROCEDURES		

1 Any power supply controlling flow has been shut off or disconnected per the applicable procedures

2 Pumps/compressors/valves controlling supply have been shut off or lines disconnected

3 Each shut-off/disconnect has been locked/tagged out

4 Lines between shut off/disconnect have been drained/bled

5 Each authorized person controls each energy source with personally assigned lock(s)

6 Each authorized person has visually verified lock out and line drain/bleed

7 Each authorized person has physically tested shut-off valves to verify de-energization

FLUID/GAS PIPE PROCEDURES		

1 Any power supply controlling flow has been shut off or disconnected per the applicable procedures

2 All valves controlling supply to equipment have been shut off or lines disconnected/blanked

3 Each shut-off/line-break has been locked/tagged out

4 Piping between shut off/disconnect/blank have been drained/bled

5 Each authorized person controls each energy source with personally assigned lock(s)

6 Each authorized person has visually verified lock out and pipe drain/bleed

7 Each authorized person has physically tested shut-off valves to verify de-energization

MECHANICAL PROCEDURES (including potential gravity effect, spring loads, etc.)		

1 All electrical/hydraulic/pneumatic power sources locked/tagged per applicable procedures

2 All hazardous components that could drop, move, or release tension have been blocked or chained

3 Each block/chain locked/tagged to prevent removal

4 Each authorized person controls each energy source with personally assigned lock(s)

5 Each authorized person has visually verified lock out

6 Each authorized person has affirmed block/chain security

ENERGY RELEASE		

1 Authorized persons have verified work completed and all tools/parts are accounted for/removed

2 All debris, shop rags, and incidental items have been cleaned out

3 All guards have been replaced as allowed by the start-up sequence

4 Controls have been set in their safest position

5 All authorized and affected persons have been notified of the start-up and safely positioned

6 Locks/tags have been removed only by the individuals to whom they belong

CHECKLIST COMPLETED BY:

PRINTED NAME *Signature* DATE

LINE BREAK PERMIT

Plant Name
Plant Location

Name of Line Break
Location of Line Break

Contractor Name(s)

HAZARDS (list all types of potential hazardous energy; also list all hazardous chemicals/material thought to ever have been in the line)

PROTECTIVE MEASURES

Personal Protective Equipment	CHECK YES	CHECK NO	DATE COMPLETE
Boots – Rubber			
Coveralls – Cloth			
Coveralls – Tyvek			
Dosimetry–Chemical (specify) _____			
Gloves – Leather			
Gloves – Long			
Gloves – Rubber			
Goggles			
Hood – Acid			
Respirator – Full Face			
Respirator – Half Face			
Respirator – Air Supplied			
Respirator – SCBA			
Shield – Face			
Shield – Special Shielding			
Suit – Acid			
Suit – Hot			
Suit – Rain			
Spill Containment			
Other:			
Other:			
Other:			
Other:			

Other Protection Measures	CHECK YES	CHECK NO	DATE COMPLETE
Barricade – ft. Radius (above/below)			
Blanks to be Installed			
Block Valve Shut			
Fire Extinguisher			
Grating, Floor Opening Covered			
Lock/Tag/Try Plan Required			
Monitoring (specify) _____			
Nonsparking Tools			
Piping Support Needed			
Pump Locked Out			
Spark Proof Tiles			
Standby Person (required for first time breaks)			
System Flushed			
System Less than 212 °F			
System Vented			
Valve Locked Out			
Ventilation – Exhaust			
Ventilation – Dilution			
Water Hose			
Other:			
Other:			
Other:			
Other:			

over >

PLANNING ITEMS

Depressurizing, Cleaning, and Venting Check	
Nearest Safety Shower Location (if > 50 feet, water hose must be provided)	
Nearest Eyewash Location	
Cold Pak Location	
Emergency Respirator Location	
Fire Extinguisher Location	
Fire Alarm Location	
Stretcher Location	
Planned Escape Route	

SPECIAL INSTRUCTIONS

PERMIT AUTHORIZATION

Authorization Date		Expiration Date		*Signature*
Authorization Time		Expiration Time		
Printed Name				
Plant Representative				
Contractor Representative				
Safety Representative				

over >

LETTER OF INTERPRETATION

Applicability of OSHA's LOTO standards; isolation and verification procedures.

November 16, 2000

Robert Weaver, Safety Coordinator
M&W Contractors, Inc.
P.O. Box 2510
East Peoria, IL 61611-0510

Dear Mr. Weaver:

Thank you for your November 3, 1999 letter to the Occupational Safety and Health Administration's (OSHA's) Directorate of Compliance Programs (DCP). You requested an interpretation for the definitions of "authorized employee" under 29 CFR 1910.147(b) and "qualified person" under 29 CFR 1910.399 as they pertain to verifying that a zero energy state exists on electrical equipment. You also have questions regarding 29 CFR 1910.147(d)(6) with regard to the verification of energy isolation for mechanical equipment. You indicated that your company is a construction company providing services to general industry clients.

As you seem to recognize, there are two standards that are most directly applicable to the circumstance described in your letter: 29 CFR 1910.147, The control of hazardous energy (lockout/tagout), and 29 CFR 1910.333, Selection and use of safe work practices. Section 1910.147 covers the servicing and maintenance of machines and equipment in which uncontrolled hazardous energy could cause injury to employees. Section 1910.333(b) provides procedures to protect employees who are working on or near exposed de-energized electric parts. Both standards mandate the use of locks and/or tags to control potentially hazardous energy.[1]

Please be aware that 1910.147 does not cover construction activities, or the maintenance of electric power generation, control, transformation, transmission and distribution lines and equipment. To the extent that you are engaged in construction, you must comply with the lockout and tagout provisions of 29 CFR Part 1926. See, e.g., 1926.417 and 1926.555(a)(7). To the extent that you are engaged in the maintenance of electric power generation, control, transformation, transmission and distribution lines and equipment, you must comply with the hazardous energy control (lockout and tagout) procedure provisions of 1910.269.

Your scenario, key definitions, questions, and our replies follow:

Scenario: A normal (group lockout) procedure for our employees working on mechanical equipment would be for our supervisor to accompany the host employer's representative to witness the shutdown and isolation of the necessary energies (e.g., mechanical energy; electrical energy.) As each lock is placed, the key is placed in the group lockbox and it is checked off the permit. The host employer's authorized representative then verifies the zero energy state by attempting to start the equipment. In the case of electrical shut offs a qualified electrician (employed by the host employer) shuts off the breaker or switch, and then tests the circuit to ensure it is off.[2]

Definitions: Pursuant to 1910.147(b), an "authorized employee" is a person who locks out or tags out a machine or piece of equipment in order to perform servicing or maintenance on that machine or equipment.

An "affected employee" is a person 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.

According to Section 1910.399, a "qualified employee (person)" is an individual familiar with the construction and operation of the equipment and the hazards involved.

Question 1: May an authorized employee or a qualified employee (person) verify a zero energy state for mechanical equipment?[3]

Reply: Whether the authorized or qualified employee verifies effective isolation and de-energization depends upon the energy source. For example, an electric disconnect switch may control a mechanical or an electrical energy hazard, or both, depending on the electrical system design and the nature of the work tasks involved.

With respect to employees working on or near de-energized electrical utilization systems (covered by Subpart S, Electrical, standards), both the authorized employee and the qualified employee are permitted to verify that electrical equipment has been de-energized. However, the authorized employee would need to meet and be trained on all qualified employee requirements in 1910.331 through 1910.335 and 1910.399.

The verification of isolation for mechanical hazardous energy, on the other hand, is addressed by paragraph 1910.147(d)(6). The authorized employee(s) shall, prior to the start of work, verify that the previous steps of the energy control procedure have effectively isolated the machine or equipment. These steps shall include verification that the machine or equipment has been turned off properly; that all energy isolating devices were identified, located, and operated; that the lockout or tagout devices (or application of a lock and tag for electrical control purposes) have been attached to energy isolating devices; and that stored energy has been released, discharged, and rendered safe.

A person meeting the authorized employee and/or qualified employee requirements shall, prior to the start of work, ensure that the previous steps of the energy control procedure have been taken to isolate the machine or equipment effectively. In some cases, verification may involve a deliberate attempt to start up the machine or equipment which should not be capable of energization or activation due to the application of locks and/or tags to the energy control devices.

Other appropriate means of hazardous energy verification may include visual inspection techniques (e.g., visually checking that safety blocks are in place in accordance with the energy control procedure; visually checking a pipe "sight glass" for the absence of a fluid) or testing the machine or equipment with an appropriate test instrument (e.g., voltmeter; combustible gas/oxygen indicator.) One key difference between the electrical verification process and the verification process in 1910.147(d)(6) is the mandated use of electrical test equipment, under 1910.333(b)(2)(iv)(B), to verify that the circuits and electrical parts of the equipment are de-energized.

Question 2: Does it matter who employs the individual who is assigned to shutdown the equipment and to verify isolation and de-energization?

Reply: No. Any affected or authorized person may shut down a machine or piece of equipment, as long as that person follows the procedures established for shutting down the machine or piece of equipment in accordance to 1910.147(d)(2). Prior to the time that the authorized employee(s) start to work on a machine or a piece of equipment that has been locked out or tagged out, the authorized employee(s) shall verify isolation and de-energization of the machine or the piece of equipment. While isolation and de-energization may be accomplished by a single authorized employee (a "primary authorized employee") in a group lockout/tagout scenario, each authorized employee has the right to participate in the verification process, if he/she chooses to do so. For additional guidance, please refer to the attached November 16, 1999 letter on the subject to Environmental Management and Training Systems, Inc.

Question 3: Do we have to employ (or train) our own representative for this phase of the lockout procedure?

Reply: You are not required to employ or train your own representative to shut down the equipment if the host employer has assigned an employee to shut down the equipment and that employee follows the established shutdown procedure. However, you are required to train each authorized employee 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 as described in 1910.147(c)(7)(i)(A).

Question 4: Since we are not authorized to initiate the shutdown, and are only authorized to work on the equipment once it is shutdown, shouldn't we be considered "affected employees"? The term "authorized employee" implies authority and expertise that we do not have, yet we are qualified to retool or otherwise perform work on the shutdown piece of equipment.

Reply: In the situation you describe, your employees are considered "authorized employees" pursuant to 1910.147. An "affected employee" becomes an "authorized employee" when that employee's duties include the performance of servicing or maintenance as defined under 1910.147(b). The duties of your employees include servicing or maintenance activities.

In addition, you want to know what your responsibilities are to ensure that the host employer's energy control procedures effectively protect your employees. When employees are working on machines or equipment in which the uncontrolled hazardous energy could cause injury to employees, both the host employer and the contractor employer have independent obligations to provide the protection under the standard for their respective employees.

OSHA recognizes that the host employer often will have greater familiarity with the energy control procedures used at the host facility; however, contract employers may have their own procedures for protecting their employees from hazardous energy. Thus, at 29 CFR 1910.147(f)(2)(i), the standard requires the host employer and contract employer to inform each other about their respective lockout or tagout procedures. Such coordination is necessary to ensure that both sets of employees will be protected from hazardous energy.

A contractor employer would not be obligated under the OSH Act to independently audit the host employer's energy control procedures. However, the contractor employer must take reasonable steps consistent with its authority to protect its employees if the contractor knows, or has reason to know, that the host employer's energy control procedures are deficient or otherwise insufficient to provide the requisite protection to its employees.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at http://www.osha.gov. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at (202) 693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Compliance Programs

BLANK

SUMMARY

1. Hazardous energy can take several forms, including electrical, mechanical, hydraulic, pneumatic, chemical, gravitational, magnetic and thermal. These hazards must be controlled before maintenance or repair work begins.

2. This includes electrical power equipment, gas lines, process piping, flowable material chutes/conduits, portable equipment (compressors, generators, mixers, screeds, pumps, etc.), and also heavy equipment/machinery/vehicles and their components that can create a hazard by moving, rotating or falling.

3. Any existing or potential energy source must be evaluated.

4. Lock-out/tag-out may be performed only by the authorized employees who are performing the service or maintenance work.

5. A lock/tag is required for each employee doing the work.

6. Locks and tags must be singularly identified and are the only devices that can be used for controlling energy. These may not be used for other purposes.

7. Locks/tags must be affixed to each energy-isolating device (switches, levers, valve covers, line blanks, braces, etc.) by authorized employees and must be affixed in a manner to that will hold the energy-isolating devices in a "safe" or "off" position.

8. Following the application of locks/tags, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.

9. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation must be continued until the service or maintenance work is completed.

10. Prior to starting work, the authorized employee(s) must verify that the energy sources have effectively been isolated (“try-out”).

11. Before locks/tags are removed and energy is restored, the work area must be inspected to ensure that:

- **a.** nonessential items have been removed;
- **b.** the machine or equipment components are operationally intact; and
- **c.** all employees have been safely positioned or removed.

12. Only the employee who applied the lock/tag may remove the lock/tag, unless certain conditions are met and document under extenuating circumstances.

13. Line breaks (other than “hot taps”) are also subject to LOTO procedures.

RESUMEN DE LA CAPACITACIÓN – AISLAMIENTO DE LA ENERGÍA (BLOQUEO/ETIQUETADO)

1. La energía peligrosa puede tener muchas formas, incluyendo la eléctrica, mecánica, hidráulica, neumática, química, gravitacional, magnética y termal. Estos peligros se deben controlar antes de iniciar trabajos de mantenimiento o reparación.
2. Esto incluye equipo de energía eléctrica, líneas de gas, procesos de entubación, conductos de material fluido, equipo portátil (compresores, generadores, mezcladores, soleras, bombas, etc.), y también equipo/maquinaria/vehículos pesados y sus componentes que puedan presentar un riesgo al moverse, rotar o caer.
3. Se debe evaluar toda fuente de energía existente o potencial.
4. El bloqueo/etiquetado solo puede ser realizado por empleados autorizados que estén ejecutando el servicio o trabajo de mantenimiento.
5. Se requiere un bloqueo/etiquetado por cada empleado que se encuentre realizando el trabajo.
6. Los bloqueos y etiquetados deben estar perfectamente identificados y son los únicos dispositivos que se pueden usar para controlar la energía. No se pueden usar con otros fines.
7. Los bloqueos/etiquetados deben ser puestos en cada dispositivo de aislamiento de energía (interruptores, palancas, cubiertas de válvula, supresores de línea, abrazaderas, etc.) por empleados autorizados y deben estar fijos de manera que mantengan al dispositivo en posición “segura” o de “apagado”.
8. Luego de la aplicación de bloqueos/etiquetados, toda la energía almacenada o residual potencialmente peligrosa debe ser descargada, desconectada, contenida o considerada segura.
9. Si hay posibilidad de reacumulación de energía almacenada a un nivel peligroso, se debe continuar la verificación del aislamiento hasta que el servicio o trabajo de mantenimiento esté terminado.
10. Antes de iniciar el trabajo, los empleados autorizados deben verificar que las fuentes de energía hayan sido efectivamente aisladas (“ensayo”).
11. Antes de retirar los bloqueos/etiquetados y se restaure la energía, el área de trabajo debe ser inspeccionada para asegurar que:
    a. los artículos no esenciales hayan sido retirados;
    b. la máquina o componentes del equipo estén operativamente intactos; y
    c. todos los empleados estén seguros o hayan dejado las instalaciones.
12. Únicamente el empleado que colocó el bloqueo/etiquetado está autorizado para retirarlo.
13. Saltos de línea (salvo "hot TAP" o línea viva penetraciones) también están sujetos a procedimientos LOTO (bloqueo/etiquetado).

TRAINING PLAN

A. *Communicate the contents of this program and any applicable regulations and explain where and how to access both.*

B. *Administer the following quiz and make sure all participants know and understand the correct answers.*
This can be a group exercise, or the blank quiz on following page can be used by individual participants.

1 Energized can mean energy in motion from its source or it can reference potential energy that is stored or residual.
- ✓ **a** True
- **b** False

2 Types of energy may include:
- **a** Electrical
- **b** Mechanical
- **c** Pneumatic
- **d** Hydraulic
- **e** Chemical/Thermal
- ✓ **f** Any of the above

3 A worker can, generally, rely on others not to restart a piece of equipment until he or she is out of harm's way.
- **a** True
- ✓ **b** False

4 What does the abbreviation "LOTO" reference?
- **a** Lay-Off-The-On button
- ✓ **b** Hazardous Energy Control (Lock-Out/Tag-Out)
- **c** Quality specifications

5 Only an ___ _____ _____ may affix lock-out/tag-out devices for the purpose of energy isolation.
- **a** A supervisor
- **b** A safety monitor
- ✓ **c** An authorized employee
- **d** None of the above

6 Each authorized employee must receive training on:
- **a** The applicable energy sources
- **b** The type and magnitude of the energy
- **c** The methods and means for controlling and isolating the energy
- ✓ **d** All of the above

1 Energía puede significar energía en movimiento o puede hacer referencia a energía potencial almacenada o residual.
- ✓ **a** Verdadero
- **b** Falso

2 Tipos de energía pueden incluir:
- **a** Eléctrica
- **b** Accionado mecánicamente
- **c** Accionada neumáticamente
- **d** Hidráulica
- **e** Químicos y térmicos
- ✓ **f** Cualquiera de los anteriores

3 Un trabajador puede, en general, dependen de otros no para reiniciar un pedazo de equipo hasta que él o ella está fuera de daños.
- **a** Verdadero
- ✓ **b** Falso

4 ¿Qué significa la abreviatura referencia "LOTO" (bloqueo/etiquetado)?
- **a** No toque el comienzo botón
- ✓ **b** Control de energía peligrosa (bloqueo / etiquetado)
- **c** Especificaciones de calidad

5 Sólo ___ _____ _____ puede fijar dispositivos de bloqueo/etiquetado con el fin de aislamiento de energía.
- **a** El supervisor
- **b** Un monitor de seguridad
- ✓ **c** Un empleado autorizado
- **d** Ninguno de los anteriores

6 Cada empleado autorizado debe recibir capacitación en:
- **a** Fuentes de la energía aplicable
- **b** El tipo y la magnitud de la energía
- **c** Los métodos y medios para controlar y aislar la energía
- ✓ **d** Todo lo anterior

7 A lock that is usually used to secure an employee locker may sometimes be used as a LOTO device.
- **a** True
- ✓ **b** False

7 Un candado que generalmente se usa para fijar el armario de un empleado a veces puede usarse como un dispositivo LOTO (bloqueo / etiquetado).
- **a** Verdadero
- ✓ **b** Falso

8 Following the application of LOTO devices, all potentially hazardous residual energy or stored energy must be relieved, disconnected, restrained, and otherwise rendered safe.
- ✓ **a** True
- **b** False

8 Tras la aplicación de dispositivos LOTO (bloqueo / etiquetado), toda la energía residual potencialmente peligrosa o energía almacenada relevado, desconectar, refrenado y puesto a salvo de lesiones.
- ✓ **a** Verdadero
- **b** Falso

9 Both authorized and affected employees must receive training specific to the equipment and their responsibilities, and all who may be in an area where LOTO procedures are underway must be informed of prohibitions against:
- **a** Restarting the equipment or machinery
- **b** Removing or tampering with lockout/tagout devices
- ✓ **c** Both of the above

9 Ambos autorización y empleados afectados deben recibir formación específica a los procedimientos y sus responsabilidades, y todos los que estén en un área donde los procedimientos LOTO (bloqueo / etiquetado) en marcha deben estar informados de las prohibiciones contra:
- **a** Reiniciar el equipo o maquinaria
- **b** Eliminación o manipulación de dispositivos de bloqueo y etiquetado
- ✓ **c** Ambos de lo anterior

10 Prior to starting work, the authorized employee must _____ (by try-out) that isolation/de-energization has actually been accomplished.
- **a** Assume
- **b** Rely on plant maintenance to confirm
- **c** Rely on a supervisor to confirm
- ✓ **d** Verify

10 Antes de comenzar el trabajo, el empleado autorizado debe _____ (por prueba) eso aislamiento/de-energization realmente se ha logrado.
- **a** Asumir
- **b** Confíe el mantenimiento de la planta para confirmar
- **c** Confíe en un supervisor para confirmar
- ✓ **d** Comprobar

11 Locks must:
- **a** Be standardized by color, shape or size
- **b** Be substantial enough that it would require the use of bolt cutters for removal
- **c** Indicate the identity of the employee applying the device
- ✓ **d** All of the above

11 El candado debe:
- **a** Estandarizarse por color, forma o tamaño
- **b** Ser lo suficientemente sustancial como para que requeriría el uso de cortadores de perno para el retiro
- **c** Indicar la identidad del empleado, aplicando el dispositivo
- ✓ Todo lo anterior

12 When the work is performed by a group, the procedures must provide the same level of protection for each employee as would the attachment of a personal LOTO device
- ✓ **a** True
- **b** False

12 Cuando el trabajo es realizado por un grupo, los procedimientos deben proporcionar el mismo nivel de protección para cada empleado como el accesorio de un dispositivo personal de LOTO (bloqueo / etiquetado).
- ✓ **a** Verdadero
- **b** Falso

13 The reason that the same level of protection must be provided for each employee in the group is because an effective LOTO program provides _____ control to each of those exposed to the hazard.
- **a** Supervisory
- **b** Competent person
- ✓ **c** Individual

13 La razón por la que debe proporcionar el mismo nivel de protección para cada empleado en el grupo es ya un programa eficaz de LOTO (bloqueo / etiquetado) proporciona control _____ a cada uno de los expuestos al riesgo.
- **a** Supervisión
- **b** Competente persona
- ✓ **c** Persona individual

14 Line breaks (other than "hot taps") are also subject to LOTO procedures, including but not limited to:
- **a** Valve closure, blocking or blanking, disconnecting or some other effective means of isolation
- **b** Securing the isolation point(s) with a LOTO device
- **c** Bleeding off the remaining contents contained by the isolation point(s)
- **d** Monitoring the atmosphere if hazardous gases could be present
- **e** Wearing the appropriate personal protective equipment
- ✓ **f** All of the above

14 Saltos de línea (distinto de la línea viva o "hot taps") también están sujetos a los procedimientos LOTO (bloqueo / etiquetado), incluyendo pero no limitado a:
- **a** Cierre de la válvula, bloqueo o cegamiento, desconexión o algún otro medio eficaz para aislar el flujo
- **b** Bloqueo/etiquetado los puntos de aislamiento con un dispositivo LOTO
- **c** Sangrado, drenaje de los restantes contenidos contenidos en los puntos de aislamiento
- **d** Monitoreo de la atmósfera si gases peligrosos podrían estar presents
- **e** Usar el equipo de protección personal
- ✓ **f** Todo lo anterior

15 Before LOTO devices are removed and energy is restored, procedures must be followed that ensure:
- **a** Nonessential items have been removed and operational components are intact
- **b** All personnel have been safely positioned or removed
- **c** Affected personnel have also been notified that the LOTO devices have been removed and start-up is imminent
- ✓ **d** All of the above

15 Antes de que se retiren los dispositivos LOTO (bloqueo / etiquetado) y se restablezca la energía, se deben seguir procedimientos que garanticen:
- **a** Se han eliminado los elementos no esenciales y componentes operacionales están intactos
- **b** Todo el personal ha sido colocado o quitar con seguridad
- **c** Personal afectados también ha sido notificados que los dispositivos LOTO (bloqueo / etiquetado) han sido eliminados y puesta en marcha es inminente
- ✓ **d** Todo lo anterior

C. *Identify lock/tag standardization characteristics for facility.*

D. *Demonstrate common LOTO devices (locks, hasps, valve covers, group box, etc).*

E. *Review at least three equipment-specific LOTO procedures.*

F. *Perform at least one LOTO procedure, making sure to include verification (try-out) step.*

G. *Complete the training report.*

Identify additional topic(s) and training resources (if any), check the training steps to verify completion, and include the date and location of the training and the supervisor/facilitator name and signature.

BLANK

BLANK quiz for individual participant completion

PARTICIPANTS NAME – PRINTED *DATE*

1 Energized can mean energy in motion from its source or it can reference potential energy that is stored or residual.
- **a** True
- **b** False

2 Types of energy may include:
- **a** Electrical
- **b** Mechanical
- **c** Pneumatic
- **d** Hydraulic
- **e** Chemical/Thermal
- **f** Any of the above

3 A worker can, generally, rely on others not to restart a piece of equipment until he or she is out of harm's way.
- **a** True
- **b** False

4 What does the abbreviation "LOTO" reference?
- **a** Lay-Off-The-On button
- **b** Control of Hazardous Energy (Lock-Out/Tag-Out)
- **c** Quality specifications

5 Only ___ _____ _____ may affix lock-out/tag-out devices for the purpose of energy isolation.
- **a** A supervisor
- **b** A safety monitor
- **c** An authorized employee
- **d** None of the above

6 Each authorized employee must receive training on:
- **a** The applicable energy sources
- **b** The type and magnitude of the energy
- **c** The methods and means for controlling and isolating the energy
- **d** All of the above

1 Energía puede significar energía en movimiento o puede hacer referencia a energía potencial almacenada o residual.
- **a** Verdadero
- **b** Falso

2 Tipos de energía pueden incluir:
- **a** Eléctrica
- **b** Accionado mecánicamente
- **c** Accionada neumáticamente
- **d** Hidráulica
- **e** Químicos y térmicos
- **f** Cualquiera de los anteriores

3 Un trabajador puede, en general, dependen de otros no para reiniciar un pedazo de equipo hasta que él o ella está fuera de daños.
- **a** Verdadero
- **b** Falso

4 ¿Qué significa la abreviatura referencia "LOTO" (bloqueo/etiquetado)?
- **a** No toque el comienzo botón
- **b** Control de energía peligrosa (bloqueo / etiquetado)
- **c** Especificaciones de calidad

5 Sólo ___ _____ _____ puede fijar dispositivos de bloqueo/etiquetado con el fin de aislamiento de energía.
- **a** El supervisor
- **b** Un monitor de seguridad
- **c** Un empleado autorizado
- **d** Ninguno de los anteriores

6 Cada empleado autorizado debe recibir capacitación en:
- **a** Fuentes de la energía aplicable
- **b** El tipo y la magnitud de la energía
- **c** Los métodos y medios para controlar y aislar la energía
- **d** Todo lo anterior

7 A lock that is usually used to secure an employee locker may sometimes be used as a LOTO device.
- **a** True
- **b** False

8 Following the application of LOTO devices, all potentially hazardous residual energy or stored energy must be relieved, disconnected, restrained, and otherwise rendered safe.
- **a** True
- **b** False

9 Both authorized and affected employees must receive training specific to the equipment and their responsibilities, and all who may be in an area where LOTO procedures are underway must be informed of prohibitions against:
- **a** Removing or tampering with lockout/tagout devices
- **b** Restarting the equipment or machinery
- **c** Both of the above

10 Prior to starting work, the authorized employee must _____ (by try-out) that isolation/de-energization has actually been accomplished.
- **a** Assume
- **b** Rely on plant maintenance to confirm
- **c** Rely on a supervisor to confirm
- **d** Verify

11 Locks must:
- **a** Be standardized by color, shape or size
- **b** Be substantial enough that it would require the use of bolt cutters for removal
- **c** Indicate the identity of the employee applying the device
- **d** All of the above

12 When the work is performed by a group, the procedures must provide the same level of protection for each employee as would the attachment of a personal LOTO device
- **a** True
- **b** False

7 Un candado que generalmente se usa para fijar el armario de un empleado a veces puede usarse como un dispositivo LOTO (bloqueo / etiquetado).
- **a** Verdadero
- **b** Falso

8 Tras la aplicación de dispositivos LOTO (bloqueo / etiquetado), toda la energía residual potencialmente peligrosa o energía almacenada relevado, desconectar, refrenado y puesto a salvo de lesiones.
- **a** Verdadero
- **b** Falso

9 Ambos autorización y empleados afectados deben recibir formación específica a los procedimientos y sus responsabilidades, y todos los que estén en un área donde los procedimientos LOTO (bloqueo / etiquetado) en marcha deben estar informados de las prohibiciones contra:
- **a** Eliminación o manipulación de dispositivos de bloqueo y etiquetado
- **b** Reiniciar el equipo o maquinaria
- **c** Ambos de lo anterior

10 Antes de comenzar el trabajo, el empleado autorizado debe _____ (por prueba) eso aislamiento/de-energization realmente se ha logrado.
- **a** Asumir
- **b** Confíe el mantenimiento de la planta para confirmar
- **c** Confíe en un supervisor para confirmar
- **d** Comprobar

11 El candado debe:
- **a** Estandarizarse por color, forma o tamaño
- **b** Ser lo suficientemente sustancial como para que requeriría el uso de cortadores de perno para el retiro
- **c** Indicar la identidad del empleado, aplicando el dispositivo
  Todo lo anterior

12 Cuando el trabajo es realizado por un grupo, los procedimientos deben proporcionar el mismo nivel de protección para cada empleado como el accesorio de un dispositivo personal de LOTO (bloqueo / etiquetado).
- **a** Verdadero
- **b** Falso

13 The reason that the same level of protection must be provided for each employee in the group is because an effective LOTO program provides _____ control to each of those exposed to the hazard.
- **a** Supervisory
- **b** Competent person
- **c** Individual

13 La razón por la que debe proporcionar el mismo nivel de protección para cada empleado en el grupo es ya un programa eficaz de LOTO (bloqueo / etiquetado) proporciona control _____ a cada uno de los expuestos al riesgo.
- **a** Supervisión
- **b** Competente persona
- **c** Persona individual

14 Line breaks (other than “hot taps”) are also subject to LOTO procedures, including but not limited to:
- **a** Valve closure, blocking or blanking, disconnecting or some other effective means of isolation
- **b** Securing the isolation point(s) with a LOTO device
- **c** Bleeding off the remaining contents contained by the isolation point(s)
- **d** Monitoring the atmosphere if hazardous gases could be present
- **e** Wearing the appropriate personal protective equipment
- **f** All of the above

14 Saltos de línea (distinto de la línea viva o "hot taps") también están sujetos a los procedimientos LOTO (bloqueo / etiquetado), incluyendo pero no limitado a:
- **a** Cierre de la válvula, bloqueo o cegamiento, desconexión o algún otro medio eficaz para aislar el flujo
- **b** Bloqueo/etiquetado los puntos de aislamiento con un dispositivo LOTO
- **c** Sangrado, drenaje de los restantes contenidos contenidos en los puntos de aislamiento
- **d** Monitoreo de la atmósfera si gases peligrosos podrían estar presents
- **e** Usar el equipo de protección personal
- **f** Todo lo anterior

15 Before LOTO devices are removed and energy is restored, procedures must be followed that ensure:
- **a** Nonessential items have been removed and operational components are intact
- **b** All personnel have been safely positioned or removed
- **c** Affected personnel have also been notified that the LOTO devices have been removed and start-up is imminent
- **d** All of the above

15 Antes de que se retiren los dispositivos LOTO (bloqueo / etiquetado) y se restablezca la energía, se deben seguir procedimientos que garanticen:
- **a** Se han eliminado los elementos no esenciales y componentes operacionales están intactos
- **b** Todo el personal ha sido colocado o quitar con seguridad
- **c** Personal afectados también ha sido notificados que los dispositivos LOTO (bloqueo / etiquetado) han sido eliminados y puesta en marcha es inminente
- **d** Todo lo anterior

Signature