

	COMPANY HEALTH AND SAFETY PROGRAM	
	Document No. 8.3	Date: August 17, 2006
	Hazardous Energy Control Program	Revision: 0

1.0 PURPOSE

This program defines the minimum requirements involving the control of hazardous energies (electrical, chemical, thermal, mechanical, pneumatic, radiological, and hydraulic) through lockout/tagout procedures. The requirements are set forth in OSHA 29 CFR 1910.147 and 1926.417.

2.0 SCOPE

This program applies to all HES projects that involve energized equipment. It covers the maintenance and servicing of equipment in which the unexpected energizing or start up of the equipment, or release of stored energy could cause injury to employees.

3.0 PROGRAM MAINTENANCE

This program will be maintained by the Health & Safety Manager and approved by the Director, Environmental Services with each new revision.

4.0 DEFINITIONS

Many of the terms used in this program have been defined in 29 CFR 1910.147. The following terms are commonly used:

- *Affected employee* - An employee whose job requires him/her to operate a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires work in an area in which 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.
- *Energy isolating device* - A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:
 1. A manually operated electrical circuit breaker
 2. A disconnect switch
 3. 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.
 4. A line valve
 5. A block
 6. And any similar switches used to block or isolate energy.

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

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- *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 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.
- *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 the tagout device is removed.

5.0 POLICY

Affected and authorized personnel effort will be expected to avoid situations of unexpected energizing, start-up, or the release of stored energy or electricity, or the release of pressurized chemical fluids with the potential to cause harm to personnel. Procedures are effective only when supervisors and employees together commit to the safe practices involved with this program and procedure.

The client representative will be requested, prior to the start of work, to de-energize and make inoperable, all equipment, electrical circuits, and vessels containing chemicals or pressurized fluids affecting the work area. The client representative will have all locks and tags attached at all points where energizing may occur, unless otherwise noted in the contract. HES personnel may assume the task if required to do so contractually or if the client representative is unavailable.

An unexpected release of any energy source can expose employees to moving equipment, electrical shock, burns, suffocation, and hazardous chemical exposure. Exposure to all power sources causing a potential hazard release must be properly locked or tagged for employee protection.

If repairs or procedures require personnel to work in or around equipment with temporarily removed guards or other safety protective devices, steps must be taken to eliminate all sources of energizing.

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6.0 RESPONSIBILITY

HES will implement the necessary measures to prevent unauthorized energizing. Procedures or practices will be supplemented and implemented to ensure safe work activities.

The *Supervisor* will be responsible for the following:

- Ensure that the client representative has successfully de-energized all sources of hazardous energies affecting the work or in the immediate vicinity of the work area prior to the start of work;
- Request that lockout or tagout devices be attached to all control points by the client representative where hazard sources may be energized;
- In cases where the client representative is unable to provide the support as described above then the supervisor will be responsible for implementing the proper lockout or tagout procedures for the work area via himself/herself or ensuring a competent person is available to take the responsibility;
- Define the purpose of the procedure to personnel including the use of Lockout/Tagout procedures, the identification of proper methods and the means of isolation for hazardous energies through de-energizing prior to work and re-energizing after the work has been completed. The Health & Safety Manager will provide support in this effort; and
- Provide locks and/or tags required for the Lockout/Tagout procedure;

The *Employee(s)* will be responsible for the following:

- Knowing and following the defined safe work practices or procedures affected by their work activities; and
- Immediately notify any unsafe conditions to the supervisor.

Authorized employees are responsible for compliance with the requirements of the program and for advising the Supervisor or Health & Safety Manager of any deficiencies in the program.

Affected employees are responsible for ensuring that their actions do not jeopardize the safety and health of persons who are working under a lock-out/tag-out activity.

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7.0 HAZARD RECOGNITION

Hazardous energy that can be controlled through lockout/tagout procedures is typically identified during preparation of the site-specific health and safety plan and communicated during site training. HES project management, contractors, supervisors, and site health and safety officer will use the **Table 1** checklist, included in this program to aid in identifying conditions requiring lockout/tagout procedures.

The owner or operator may also be helpful in identifying hazards in relation to control points and power sources with hazardous energies.

8.0 LOCKOUT DEVICE REQUIREMENTS

Lockout devices use a positive means to keep an energy isolating device in a safe position and preventing the accidental release of energy by a locking mechanism. Keyed or combination locks will be the only locking devices used. Locks will follow the following criteria:

- Be capable of withstanding the environment being placed in;
- Identifiable as lockout device by all personnel;
- Clearly visible to personnel in the work area;
- Standardized by color, shape, size, or type of lock; and
- Will identify the personnel who applied the lock, unless it is accompanied by a tag.

9.0 TAGOUT DEVICE REQUIREMENTS

Tagout devices indicate that energy isolating devices are not to be tampered with. Tags must be securely fastened to energy isolating devices. Tags will follow the following criteria:

- Designed and printed so that the message on the tag will not deteriorate, or become illegible due to exposures;
- Identifiable as tagout devices by all personnel;
- Clearly visible to personnel in the work area;
- Standardized by color, shape, size, or format of tag;

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- Tags and attachment devices must be durable enough to prevent accidental removal;
- Will identify the personnel who attached the tag and include a legend such as “DO NOT START,” “DO NOT OPEN,” “DO NOT CLOSE,” “DO NOT ENERGIZE,” “DO NOT OPERATE,” etc.;
- Will warn of the hazardous conditions created if the machine or equipment becomes energized; and
- Attachment devices should be nylon cable ties.

10.0 LOCKOUT/ TAGOUT PROCEDURE

Coordination will be made with client representative, contractor, or subcontractor personnel prior to work activities requiring the locking out or tagging out of equipment. The following procedures should be followed when HES personnel are involved with the locking out or tagging out of equipment:

1. Supervisors on the job should be provided with a separate lock and key, as well as tags for tagging out equipment or controls. Individual lock sets remain with each affected supervisor who will be responsible for placing his or her own locks or tags on equipment so operation or release is prevented.
2. The work operations should be pre-planned to ensure that all affected parties are notified. A multiple lockout device may be required for multiple locking of equipment.
3. Prior to allowing work activities to begin near the energized equipment, all energized sources must be de-energized and locked out accordingly. A tag may be used to identify the responsible party who may authorize unlocking and re-energizing.
4. Electricians may be used to disconnect power from the main disconnect location for the equipment involved.
5. The authorized employee locking out or tagging the equipment should verify that the de-energized equipment is in the correct state prior to work activities commencing.

CAUTION: Return operating control(s) to neutral or “off” position after verifying the isolation of the equipment.

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

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7. Any other personnel who are involved or affected by the lockout/tagout process should add their lock and tag and verify the equipment or circuits are de-energized accordingly.
8. Locks and tags should remain in place or be replaced by other affected personnel to ensure that those involved remain responsible for their own locks and the work activities involved in their work period.

NOTE: Lockout and Tagout devices should be color coded or otherwise identifiable by owners name to personnel involved in the work area.

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition through the removal of lockout/tagout devices, the following steps will be taken:

1. Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
2. Check the work area to ensure that all employees have been safely positioned or removed from the area.
3. Verify that the controls are in neutral.
4. Whenever possible, lockout/tagout devices will only be removed by the individual who attached the device.
5. Remove the lockout devices and re-energize the machine or equipment.
6. Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

When the servicing or maintenance calls for temporary removal of lockout/tagout devices from the energy isolating device(s) only to test the machine, equipment, component, or system, the following steps will be taken:

1. Lockout/tagout devices will only be removed by the employee(s) who installed the devices.
2. All affected employees will be notified that lockout/tagout devices will be temporarily removed.
3. The area will be inspected to assure that nonessential items have been removed and that the system is operationally intact.

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4. Employees will be safely positioned or removed.
5. The system can then be tested.
6. The energy source will be isolated, locked out/tagged out, and verified in accordance with established procedures prior to resumption of work.

When lockout/tagout work is performed by a crew, craft, or department known as group lockout/tagout they will utilize an approach that allows the employee a level of protection equivalent to that provided by the implementation of a personal lockout/tagout device. Requirements are listed below:

1. Primary responsibility is vested in an authorized employee, (i.e. Site Health & Safety Officer, Supervisor) appointed by the Project Manager, for a number of employees working under the protection of a group lockout/tagout device. Each affected employee working under the protection of a group lockout/tagout device must sign a "Master Lockout List" prior to work beginning and re-energizing the system. These signatures will indicate that each affected employee has reviewed the work to be done and been informed of the lockout/tagout system.
2. The authorized employee must be able to determine the exposure status of individual group members.
3. When more than one crew, craft, or department is involved the authorized employee, assigned by the Project manager, will coordinate affected work forces and assure continuity of protection.

11.0 SUBCONTRACTORS

The HES Project Manager or Site Health & Safety Officer will inform each subcontractor of the lockout/tagout procedures. If a subcontractor or other employer's programs are to be followed, pending approval from the HES Health & Safety Manager, the HES Project Manager or Supervisor will ensure that a copy of the program is reviewed and communicated to all affected employees.

12.0 TRAINING

Authorized employees will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the project facility, and the methods necessary for energy isolation and control. Affected employees will be instructed in the purpose and use of the energy control procedure and about the prohibition in relation to attempts to restart or re-energize machines or equipment that is locked out or tagged out.

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Training will be conducted at the project site if not conducted before by the Project Manager, Supervisor, Site Health & Safety Officer, or by the electrical contractor, if applicable. Training will be documented consisting of the employee name, trainer's name, date of training, and outline of information discussed. Employees will be retrained, as necessary, to ensure the continued protection of all workers.

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Conditions Subject to the Hazardous Energy Control (Lockout/Tagout) Program				
Condition/Activity			Yes	No
1	Will work be performed on electrical conductors or electrical equipment that is not connected by a cord and plug set, or that is so connected but the cord cannot be unplugged and/or the plug cannot be controlled exclusively by the worker?			
2	Does work involve the demolition of buildings or equipment that contains electrical service?			
3	Will work be performed within striking distance of the movable parts of machinery or equipment?			
4	Will work be performed in a confined space that is part of an operational process or system or that contains energized equipment such as mixers, heaters, instrumentation, or gauges?			
5	Does work require the removal of guards or other protective devices associated with machinery and/or equipment?			
6	Will work be performed on pressurized process equipment within close proximity to pressurized process equipment by gravity or equipment containing hazardous chemicals, radiation, or steam?			
7	Does work involve the operation of heavy equipment within close proximity to pressurized process equipment, or equipment containing hazardous chemicals, radiation, or steam when barriers are not feasible?			
8	Does work involve the operation of heavy equipment within arcing distance of electrical power lines or electrical equipment, other than that which is owned by the utility company or that, which can be protected by physical barriers?			
9	Does the work involve the creation of ignition sources in an area where flammable or oxidizing materials could suddenly or unexpectedly be released from a process line, vent, or other point source?			
10	Will the work be performed in close proximity to exposed sources of convective or radiant heat/cold, or will the work be performed in direct contact with sources of conductive heat/cold?			
11	Will the work be performed in an area where noise could be suddenly and unexpectedly released at levels above 140 dBA?			
12	Will work be performed in an area where dangerous levels of microwave radiation, radio frequency radiation, laser radiation, light or near-infrared radiation, ultraviolet radiation, or infrared radiation exists or could exist?			
13	Will work be performed in an area where a dangerous static magnetic or static electric field exists or could exist?			
14	Are there any other types or sources of energy that the worker could unexpectedly encounter as a result of, or during the course of, the work to be performed?			

