Control of Hazardous Energy

Environmental Health and Safety

11/01/2014

CONTROL OF HAZARDOUS ENERGY
(LOCKOUT-TAGOUT)
OSHA CFR 1910.147

Revised Date: November 2014

STATEMENT OF POLICY

Ball State University is committed to the responsibility of providing a work environment that is free from recognized hazards for its employees. Consistent with this duty is the Standard for the Control of Hazardous Energy(Lockout/Tagout, 29 CFR 1910.147), promulgated by the Occupational Safety and Health Administration(OSHA)

Ball State University is required by OSHA's Hazardous Energy Control Standard to develop and carry out the provisions of a hazardous energy control Plan. A hazardous energy control plan is defined as the overall program for controlling machines and equipment to prevent unexpected energization, start up, or the release of stored energy in order to prevent injury to employees.

The Ball State University Hazardous Energy Control Program will be evaluated and updated at least annually. This Plan will be made readily available to employees, **their representatives and any representative of OSHA.**

Purpose:

To communicate the necessary knowledge needed for employees to safely control hazardous energy in their work environment and to maintain compliance with OSHA CFR 1910.147.

Objectives:

1. **To understand the importance of lockout/tagout.**
2. **Provide definition of terms.**
3. **To familiarize employees with equipment that must be locked/tagged out.**

3. **To understand the difference between authorized and affected employees.**

4. **To become familiar with approved lockout/tagout devices.**

5. **To familiarize and understand the procedures associated with the lockout/tagout program.**

GENERAL REQUIREMENTS

Under the OSHA Standard CFR 1910.147 the employer must:

1. **Develop an energy control program.**

2. **Use locks when equipment can be locked out.**

3. **Ensure that new equipment or overhauled equipment can accommodate locks.**

4. **Employ additional means to ensure safety when tags rather than locks are used. Must develop a tagout program that is safety sufficient.**

5. **Identify and implement specific procedures for the control of hazardous energy including preparation for shutdown, equipment isolation, lockout/tagout application release of stored energy and verification of isolation.**

6. **Institute procedures for the release of lockout/tagout including machine inspections, notification and safe positioning of employees and removal of the lockout/tagout device.**

7. **Obtain standardized locks and tags which are sufficient quality and durability to ensure their effectiveness.**

8. **Require that each lockout/tagout device be removed by the employee who applied the device.**

9. **Conduct inspections of energy control procedures at least annually.**

10. **Train employees in specific energy control procedures with training reminders as part of the annual inspections of the control procedures.**

11. **Adopt procedures to ensure safety when equipment must be tested during servicing, when outside contractors are are working at the site, when a multiple lockout is needed for crew servicing equipment and when shift personnel change.**

APPLICATIONS AND EXEMPTIONS

The OSHA Standard CFR 1910.147, the Control of Hazardous Energy, applies to the following:

1. **Covers the servicing and maintenance of equipment where unexpected energization or start-up of the equipment could harm employees.**

2. **Service and/or maintenance activities in which the employee is required to remove or bypass a guard or other safety device or required to place any part of the body inside the machine to perform work.**

GENERAL RULE: Any power sources that CAN be locked out MUST be locked out for servicing or maintenance.

Under OSHA CFR 1910.147, the Control of Hazardous Energy, the following instances are exempt from the program:

1. **Minor tool changes and adjustments and other minor servicing activities which take place during normal operations if they are routine, repetitive and integral to the use of the equipment for production provided that the work is performed using alternative measures which provide effective protection.**

2. **Work on cord and plug connected electric equipment for which exposure to the hazards is controlled by the uplugging of the equipment and the plug is in the exclusive control of the worker.**

3. **Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provide the employer demonstrates that (1) continuity of service is essential: (2) shutdown of the system is impractical: (3) documented procedures are followed and special equipment is used which will provide proven effective protection for employees.**

BENEFITS

"OSHA estimates compliance with the standard will prevent about 120 fatalities and approximately 28,000 serious and 32,000 minor injuries each year.

About 39 million general industry workers will be protected from accidents during maintenance and servicing of equipment under this ruling."

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 of equipment.**

A. The *Authorized Employee* has the following duties:

1. **Know the types of hazardous energy that may be faced during the equipment maintenance or repair operation.**

2. **Select and use equipment (gauges, meters, etc.) of sufficient sensitivity and specificity to identify and evaluate the presence of hazardous energy prior to beginning their work. If questions arise regarding the selection and use of the equipment, the authorized employee shall request assistance from their supervisor, group leader or the Facilities Planning and Management Health and Environmental Safety Office.**

3. **Select and use appropriate equipment to ensure that all forms of hazardous energy (real and potential) are controlled and isolated before the equipment maintenance or repair is started.**

4. **Verify that appropriate actions have been taken to isolate all sources of hazardous energy before the equipment maintenance or repair activity is allowed to begin (See Attachment B)**

5. **Communicate with their supervisor and any other authorized or affected employee(s) involved in the equipment maintenance, repair activity or working in the same general area to keep them apprised of the equipment's status.**

6. **Alert their supervisor when the authorized employee(s) has reason to believe that the measures taken under this program may not adequately protect employees.**

7. **Halt the equipment maintenance or repair operation immediately when there is reason to believe that the measures taken under this program may not adequately protect the authorized and or affected employees involved in the operation.**

   Note: When work is halted for this reason, the authorized employee(s) shall notify the supervisor immediately so that the supervisor and a representative of the Health and Environmental Safety Office can evaluate the situation. During the interim period, all hazardous energy control devices shall remain in place and the equipment shall remain out of service. If it is determined that the hazardous energy control procedures need to be revised, the revisions must be completed before the equipment maintenance or repair operation may continue.

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

B. An Affected Employee has the following duties:

1. **Demonstrate proficient knowledge of the purpose and use of the hazardous energy control procedure.**

2. **Know and abide by the prohibition relating to attempts to restart or re-energize machines and /or equipment which are locked and or tagged out.**

3. **Know the limitation of tagout systems.**

4. **Alert their supervisor or Health and Environmental Safety when the affected employee has reason to believe that the measures taken under this program may not adequately protect the employees.**

DEFINITIONS

Lockout: the placement of a lockout device on an energy isolating device ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Tagout: is accomplished by placing a tag on the power source. It acts as a warning not to restore energy.

Limitations of Tagout:

1. **Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock.**

2. **When a tag is attached to an energy isolating device. It is not to be removed without authorization of the authorized person responsible for it and it is never to be by passed, ignored or otherwise defeated.**

3. **Tags must be legible and understandable by all authorized and affected employees and all other employees whose work operations are or may be in the area in order to be effective.**

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

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

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

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.

General Rule: ***If a piece of equipment is capable of being locked out, it MUST be locked out. If a piece of equipment that should be locked out is not capable of being locked out notify Safety office immediately.***

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

Energy Isolating Device: A mechanical device that physically prevents transmission or release of energy.

Energy Source: Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal energy.

Lockout Device: A device that utilizes a positive means such as a lock to hold an energy isolating device in the safe position and prevent energizing of a machine or equipment.

Tagout Device: A prominent warning device which can be securely fastened to an energy isolating device to indicate that the energy isolating device and the equipment.

APPROVED LOCKOUT/TAGOUT DEVICES

1. Locks 2. Tags 3. Hasps 4. Other

C. Hazardous Energy Control (Lockout/Tagout) Procedure:

Procedures shall be established to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start-up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative. The hazardous energy control program shall contain provisions to ensure that the employee(s) performing the maintenance or service is properly trained hazardous energy control (lockout/tagout) procedures and is qualified to perform the work.

The supervisor of the employee(s) performing the maintenance or service shall perform periodic on-site inspections to ensure that appropriate lockout/tagout procedures are being followed. Specifically, the supervisor shall verify that the authorized employee:

1. **Has notified all affected employees that servicing or maintenance is required on the piece of equipment and that it must be shut down and locked or tagged out to perform the servicing or maintenance.**

2. **Has identified the type and magnitude of the energy that the machine or equipment utilizes, understands the hazards of the energy and knows the methods to control the energy.**

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3. **Has shut down the machine by the normal stopping procedure.**

4. **Has deactivated the energy by isolating the machine or or equipment from the energy source(s) with the appropriate lockout/tagout devices which should always include at least an approved lock with red core and an approved tag.**

5. **Has ensured that stored or residual energy(such as that in capacitors, springs, elevated machine members, rotating flywheels, freewheeling fan blades, hydraulic systems and air, gas, steam or water pressure etc.) has been dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.**

6. **Has ensured that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed and then verifying the isolation of the equipment by exercising the normal operating control(s) or by testing to make certain the equipment will not operate.***

***If more than one person is involved in the maintenance or service operation, each person shall apply their own lock or lockout device. After exercising controls to verify isolation, the authorized employee(s) shall ensure that the controls have been returned to the "off" position prior to beginning their maintenance and/or service activities.**

Note: If the energy isolating device is not capable of being locked out, a tagout device shall be applied and the Safety office must be notified.

D. Shift Change Procedures

In the event that the maintenance or servicing of equipment will be continued by a different employee on another shift, the supervisor(s) of the employees shall ensure that:

1. **The authorized employee began the maintenance or servicing operation has informed the authorized employee taking over the job of the status of the machine or equipment.**

2. **The authorized employee taking over the job has affixed his/her lockout and tagout devices to the energy isolation device(s).**

3. **The authorized employee leaving the job has removed his /her lockout device only after the authorized employee taking over the job has affixed his/her lockout devices to the energy isolation devices.**

Note: If in the event the servicing and/or maintenance of equipment carries over into the next shift, the transfer of authorized employees shall be coordinated through the supervisor.

4. **The authorized employee(s) taking over the job has verified that stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, freewheeling fan blades, hydraulic systems, and air, gas, steam, or water pressure, etc.) has been dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.**

5. **The authorized employee(s) taking over the job has ensured that the equipment is disconnected from the energy source(s) by first checking that the no personnel are exposed and then verifying the isolation of the equipment by exercising the normal operating control(s) or by testing to make certain the equipment will not operate***

6. **All affected employees on the incoming shift have been notified that the equipment has been placed out of service for maintenance or repairs.**

***If more than one person is involved in the maintenance or service operation, each person shall apply their own lock or lockout device. After exercising controls to verify isolation, the authorized employee(s) shall ensure that the controls have been returned to the "off" position prior to beginning their maintenance and/or service activities.**

Note: If the energy isolating device is not capable of being locked out, a tagout device shall be applied and the Safety office must be notified.

E. Supervisory Procedure for the Emergency removal of Lockout/Tagout devices

This procedure is for the emergency removal of lockout/ tagout devices by the supervisor. It is intended to provide the supervisors with a safe, functional method of removing lockout/tagout. It shall only be used when the authorized person responsible for installing the lockout/tagout device(s) is not available for lockout/tagout removal.

In the absence of the supervisor, the group leader shall assume all of the supervisor's duties and responsibilities outlined in this procedure. In the absence of the supervisor and group leader, one of the Director's (Director of Facilities Planning and Management, Director of Facilities Management, or Director of Facilities Planning) or their designee shall assume all of the duties and responsibilities outlined in this procedure.

1. The authorized person's shop supervisor shall verify that the authorized employee who applied the lockout/tagout is not at the facility.

2. The authorized person's shop supervisor shall make all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout device has been removed.

3. **The authorized person's shop supervisor shall ensure that the authorized employee has been notified that his/her lockout device has been removed before he/she resumes work at the facility.**

4. **The authorized person's shop supervisor shall complete the following prior to the actual removal of the lockout device:**

    a. **The work area shall be inspected to ensure that all non-essential items have been removed and that all machine or equipment components are operationally intact.**

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

    c. **It shall be verified that the controls are in the neutral or "off" position.**

    d. **All lockout devices shall be removed and the equipment re-energized.**

    e. **The affected employee(s) shall be notified that the servicing or maintenance is completed and the machine or equipment is ready for use.**

F. Procedure for the Testing or Positioning of Machines temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

1. **Clear the machine or equipment of tools and materials and ensure that all equipment components are operationally intact.**

2. **Remove employees from the machine or equipment area.**

3. **Remove lockout/tagout devices.**

4. **Energize and proceed with testing or positioning.**

5. **De-energize all systems and reapply energy control measures.**

OSHA 1910.147 (4) Energy Control Procedure

"Procedures shall be developed and utilized for the control of potentially hazardous energy when employee are engaged the activities covered by this section"

NOTE: Exception: The employer need not document the required procedures for a particular machine when all of the following elements exists:

1. **The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.**

2. **The machine or equipment has a single energy source which can be readily identified and isolated.**

3. **The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.**

4. **The machine or equipment is isolated from that energy source and locked out during servicing and or/maint-enance.**

5. **A single lockout device will achieve lockout condition.**

6. **The lockout device is under the exclusive control of the of the authorized employee performing the servicing or maintenance.**

7. **The servicing or maintenance does not create hazards for other employees.**

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

COMMUNICATION AND REPORTING OF PROBLEMS

1. **All questions and/ or concerns should first be addressed to your supervisor.**

2. **If dissatisfied with your supervisor's response contact the Safety Department.**

3. **All near misses should be reported to the Safety Department immediately.**

4. **In instances where a piece of equipment or machinery falls into the parameter of this program, but is physically incapable of being locked out, a tagout device shall be applied and the Safety Department should be notified immediately.**

GENERAL SAFETY ISSUES PERTAINING TO HAZARDOUS ENERGY CONTROL (LOCKOUT/TAGOUT)

- **Anything that has the capability of being locked out must be locked out prior to the start of and servicing or maintenance of equipment.**
- **Always look for hidden energy sources more than one energy source.**
- **Always use the approved lockout/tagout devices that are outlined in this program.**
- **Never use another employee's lock and never lend yours out.**
- **Never remove another employee's lockout device.**
- **Any questions or concerns pertaining to the lockout procedure should be directed to your supervisor prior to the start of any maintenance or service. Should questions or concerns arise during maintenance and/or service activities, stop work immediately and consult with your supervisor.**

G. Responsibilities

A. The supervisor has the following duties:

1. **For each piece of machinery or equipment with his or her area of responsibility that is not excluded from this procedure shall provide the following information:**

    a. **Specific location of the machine or equipment**
    b. **Name of equipment manufacturer**
    c. **Type of equipment and model #**
    d. **Manufacturer's serial number**
    e. **Ball State University inventory control #**
    f. **Specific details of the shutdown procedure**

2. **Track changes in the use of configuration of machinery or equipment with his/her area of responsibility and consult with the Facilities Planning and Management Safety Department if questions about the application of these hazardous energy control procedures arise.**

3. **Maintain copies of the "Hazardous Energy Control worksheets" applicable to his/her area of responsibility and ensure that this data is available at all times to all authorized employees under his/her direct supervision and forward original to** 21.

the Facilities Planning and Management Safety Specialist, SV205.

4. **Prevent the unauthorized performance of equipment maintenance activities by unauthorized employees or employees working in violation of these procedures in (2) manners:**

    a. **Where practical, post danger signs on equipment that is required to be locked out prior to maintenance, servicing or repair under the provisions of these procedures.**

    b. **Ensure that the proper equipment necessary to safely perform the equipment maintenance and /or repair, including any needed energy isolation devices, tags or personal protective equipment is available and used.**

5. **Ensure that all energy isolation devices, tags or personal protective equipment has been inspected and maintained as needed.**

6. **For each person he/or she supervises he/or she:**

    a. **Identify who will be an Authorized and Affected employee.**

b. Provide continuity in the shift change procedure by authorizing employee overtime to all for the exchange of lockout devices or by applying his/her own lockout device and changing it out with the next shift's authorized employee.

c. Provide with the assistance of the Facilities Planning and Management Safety Office, training to ensure each authorized and affected employees has the understanding knowledge, and skills necessary for the safe performance of their duties. Training shall be provided to each authorized or affected employees.

d. Certify that the training has been accomplished. The certification shall contain each employee's name, the signatures of the trainers and the dates of training.

e. Maintain a list of each certified person and the duties they trained to fulfill.

f. Notify the Facilities Planning and management Safety Specialist when new employees are hired into their area so proper training can be initiated.

7. Review the hazardous energy control procedures when he/she has reason to believe that the measures taken under this program may not protect employees and recommend to the Facilities Planning and Management Safety Office what revisions are needed. These revisions must be completed prior to the authorization of subsequent equipment maintenance or repair operations which involve the control of hazardous energy.

8. Forward copies of all "Hazardous Energy Control Worksheets" to the Safety Office.

9. Perform periodic on-site inspections to ensure that appropriate hazardous energy control procedures are being followed. Ensure that vendors working in your specific area are in compliance with 29 CFR 1910.147 and contact the Safety Office with any questions.

H. The Construction Superintendent has the following duties when Ball State University arranges to have a contractor perform work that involves hazardous energy:

1. **Inform the contractor that the scope of work involves hazardous energy and that all hazardous energy control procedures employed by the contractor must comply with the requirements of 29 CFR 1910.147.**

2. **Apprise the contractor of the elements, including the hazards identified and past experience with the equipment, that cause the project to require the use of hazardous energy control procedures.**

3. **Apprise the contractor of any precautions or procedures that Ball State University has implemented for the protection of affected employees in or near the area where contractor personnel will be working.**

4. **Coordinate project operations with the contractor and the Ball State University Safety Specialist when both university employees and contractor personnel will be working together on a project involving hazardous energy sources.**

5. **Inform the contractor of the requirements of the University's hazardous energy control program.**

6. **Review the contractor's hazardous energy control procedures to ensure:**

    a. **The contractor has followed the OSHA Lockout/Tagout regulation.**
    b. **The contractor possesses Energy control devices sufficient to protect employees.**
    c. **The contractor has documentation that employees have been properly trained.**

7. **Notify the Facilities Planning and Management Safety Specialist (SV205) immediately when the construction superintendent has reason to believe that a contractor's hazardous energy control procedures are not adequately protecting Ball State University's employees, students, patrons or other affected individuals in the area of the contractor's project.**

Note: In order to substantiate their fulfillment of the training requirements contained in 29 CFR 1910.147, the contractor shall be required to present a copy of their training records to the Construction Superintendent. This documentation shall include each employee's name, the dates of training and the name of the instructor. This documentation shall be filed with the project documents in Facilities Planning and Management.

BALL STATE UNIVERSITY
Hazardous Energy Control Program

Attachment A

HAZARDOUS ENERGY CONTROL WORKSHEET

Shop or Department: Building: Floor: Page _____ of _____
Supervisor:
Name of Machine or Equipment:
Name of Manufacturer: Model #:
Type of Equipment:
Manufacturer's Serial #: BSU Inventory Control #:
Specific Location of Equipment:
Natural Gas Electric Steam Pneumatic Mechanical
Type(s) of Hazardous Energy:
Primary _____ Secondary _____ Location of Shut Off Device(s)/Equipment Controls:
Location of Utility Shut Off Device(s):

Please provide specific details of the shutdown and energy control procedures for this equipment. Please be sure to include precise, step-by-step information.

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Completed by: _____ Date: _____

Name/Title

H&ES Reviewed

Approved by: _____ Date: _____

Name/Title

*Retain one copy and forward one copy to the Facilities Planning and Management Safety Specialist, SV 205.