Policy

It shall be the policy of the University of Tennessee to following accepted standards and regulations to protect the health and well being of its employees and students. The Occupational Safety and Health Administration’s (OSHA) Control of Hazardous Energy (also known as lockout/tagout) shall be implemented and followed by affected individuals.

Scope

Although the OSHA standard applies to employees, this program was written to include students and visitors to the University where feasible. Contractors are covered by this program when working with UT students or employees and while working on UT-owned equipment that could impact the safety of the students or UT employees.

Introduction

Accidents and injuries associated with unexpected equipment start up during maintenance and repair activities can be serious. Amputations, electrocutions and fatalities can occur due to failure to follow accepted lockout/tagout procedures.

The following written plan was developed to provide information and guidance for those departments on campus who have employees covered by the OSHA Lockout/Tagout standard (29 CFR 1910.147). This program also serves as a supplement to required training. The procedure is basically simple, but very important to any effective safety program.

Definitions

Authorized Individual - The term "authorized individual" is used in lieu of "authorized employee" to cover students and employees. An authorized individual is an individual who has been trained in lockout/tagout techniques and performs this type of work.

Procedure

Appendix A contains a generic procedure for lockout/tagout activities. However, this does not provide the specificity necessary for full protection.

All sources of energy must be identified before work starts and adequately controlled or tagged out.

Procedure Development and Review
A specific procedure must be developed for equipment containing more than one energy source.

Each department is encouraged to develop these written procedures. A copy of the procedure should be kept in the department's file and ideally a copy posted at the equipment.

The Lockout/Tagout Procedure (Appendix A) provides a good template for procedure development. Environmental Health and Safety is available to assist in the development of written procedures.

Procedures shall clearly outline the scope, purpose, authorization, rules and techniques to be used.

If an error or omission is detected in a specific written procedure, it is the responsibility of the authorized individual who identifies the error or omission to bring it to the attention of his or her supervisor. Corrections must then be made and communicated to each authorized individual who works with this procedure.

**Hot Tap Work**

Hot taps involve working on equipment while it is energized. Hot tap work is discouraged and should only be done where it is infeasible to do otherwise and must be done by knowledgeable authorized individuals.

Where hot tap work is conducted, additional precautions must be taken and specific written procedures must be developed. Authorized individuals performing hot tap work must be trained in these procedures.

**Signs and Warnings**

Signs must be placed on all equipment requiring lockout/tagout at the energy isolation device.

**Locks, Tags, and Other Equipment**

Locks shall be used only for lockout purposes and shall be "heavy-duty." Heavy-duty is defined as a lock that can be removed only with heavy-duty bolt cutters. The locks and tags used for lockout shall be standardized within each department. An authorized individual should never lend their lock or key to anyone else. There may be situations where several locks are necessary for a lockout. A department may elect to have several locks that can be used as a unit. However, control must be maintained over the keys.

Tags shall be held in place with a tie capable of withstanding 50 lbs. of force. At least one tag must be provided for locations where locks are applied. Note that if more than one energy isolation device (EID) is locked out, there must be a tag at each EID.
Lockout/Tagout GS 5

**Lock Removal**

Locks and/or tags must not be removed by anyone other than the authorized individual who installed it. There is one exception to this rule. The authorized individual's supervisor may remove his or her lock, but only when it is **absolutely** necessary to remove the lockout/tagout. If the lock and/or tag are removed, every effort must be made to notify the authorized individual that his or her lock has been removed. Efforts to be made to notify the authorized individual that their lock has been removed include:

i. Call the individual at home;
ii. Notify the employee immediately when they return to work; and
iii. Post a note, sign or other warning in a conspicuous location where the employee is working (ideally on the equipment).

**Equipment for lockout/tagout**

The following is a list of equipment that may be used in lockout. An adequate supply of each required item must be available for the authorized individual.

1. Lock and key
2. Tags and ties
3. Multiple lock hasp
4. Lock box (if used in the department)
5. Breaker locks
6. Fuse pullers
7. Insulated mats
8. Hot sticks
9. Chains
10. Electrical meter to determine the status of an electric circuit
11. Valve covers
12. Blocks
13. Blanks
14. Jacks
15. Supports (posts, columns, timbers, etc.)
16. Other items as necessary

**Lockout/Tagout Auditing**

The OSHA standard requires that each authorized employee be audited annually on lockout/tagout. The audit must be conducted by an authorized individual who is authorized to perform a lockout/tagout, but does not use lockout/tagout on the equipment that is being audited.
To assist departments in auditing, an audit checklist has been developed. See Appendix B at the back of this program. This form, or a similar record, should be maintained in the department's files.

**Off-Site Safety**

Each department head is responsible for identifying lockout/tagout activities affecting their employees and students while engaged in University-sponsored activities away from the main campus. Provisions shall be made to assure that these individuals are not exposed to hazards posed by activities requiring lockout/tagout.

**Contractors**

The OSHA standard requires that contractors be made aware of specific lockout/tagout procedures. Note this applies to "specific" procedures and not the general procedure found in Appendix A.

**Training**

Authorized individuals shall be trained in lockout/tagout procedures.

Training shall be provided to the following individuals:

a. New employees;

b. Employees who have transferred into the department;

c. Employees who demonstrate a lack of knowledge in the lockout/tagout procedure;

d. When new equipment is introduced, or when a specific procedure is developed or modified; and

e. Periodic refresher - recommended annually.

**Sources of Training**

1. A self-study video module is available free of charge from EHS.
2. The EHS web site
3. Programs (traditional classroom) are available upon request by Environmental Health and Safety.
4. SkillSoft
5. Certification - A multiple question test. Successful completion of this test (minimum score 70%) documents the level of knowledge of the employee.
6. Other approved sources.

The above listed sources of training are generic in nature and provide an excellent base for knowledge for the authorized individual. However, complex equipment, with more
than one source of energy, requires a specific written procedure. Individuals performing work on complex equipment should be trained on the procedures for that equipment.

**Recordkeeping**

Training must be documented. Each department must maintain a record of the training. The following information should be contained in the training record: date of training, instructor, name of employee and location and a brief description or outline of what was covered.

Provisions shall be made for individuals who have limited reading skills to ensure they are familiar with the necessary information.

A test is suggested at the end of each training program to demonstrate that the participants have the requisite knowledge.

**Standards**

OSHA 29 CFR 1910.147

**Forms**

Generic Procedure for Lockout/Tagout (Appendix A)

Lockout/tagout checklist – Annual Employee Audit (Appendix B)
Appendix A

Generic Procedure for Lockout/Tagout

1. Identify all energy sources (e.g. electrical, steam, hydraulic, etc.) and their magnitude (e.g. 120 volts, 60 psi steam, etc.). Look for hidden energy sources such as springs, capacitors, elevated parts, etc. The equipment may contain more than one type of energy.
2. Notify individuals who use the equipment that it will be taken out of service.
3. Stop the equipment by its normal shut down procedure.
4. Isolate the equipment from its energy source. This typically involves closing valves, opening switches or operating other energy isolation devices. Note - an on/off switch or run/stop switch are not energy isolation devices.
5. Dissipate or secure stored energy. This may involve repositioning, blocking, bleeding, braking, etc.
6. Apply your lock to the energy isolation device. Always provide a completed tag with your lock. A tag alone can only be used where it is infeasible to lockout an energy source. Additional precautions must be followed if only a tag is used. Each individual working on the equipment must install their lock. It may be necessary to use a multiple lock hasp.
7. Ensure that no one is exposed to danger, and then as a check to be sure that all energy sources are isolated, activate the equipment's normal controls to make certain the equipment will not operate. Check to make sure you any test equipment (e.g. multimeter) is working as designed.

**CAUTION:** Always return the controls to the "neutral" or "off" position after this test.

Only when the equipment is locked and/or tagged out may work proceed.

Temporary Removal of Lockout for Testing or Adjustments

1. Clear equipment of tools, etc.
2. Remove employees from danger zone
3. Remove lock and/or tag
4. Proceed with test by energizing the equipment
5. De-energize equipment (following steps three through seven above)

Restoring the Equipment After Work is Completed

1. Check the area around the equipment to insure that no one is exposed to danger after servicing or maintenance is complete
2. Remove all tools, loose parts, etc. from the equipment
3. Replace all guards, shields or other safety features
4. Remove the tag and lockout devices. Each person must remove their own lock
5. Operate the energy isolation device to restore energy to the equipment
Shift Changes and Prolonged Lockout/Tagout

When a shift change is occurring and the out-going shift will be removing their lockout/tagout and the incoming shift will be applying their lockout/tagout, at least one employee from each shift must be present at the equipment for the change. The incoming shift shall apply their lockout/tagout before the outgoing shift leaves.

It is acceptable to maintain a lockout continuously for an indefinite period of time.

Questions regarding the lockout/tagout procedure should be addressed to Environmental Health and Safety at 916 22nd Street, 974-5084.
APPENDIX B
LOCKOUT/TAGOUT CHECKLIST
ANNUAL EMPLOYEE AUDIT

<table>
<thead>
<tr>
<th>Employee:</th>
<th>Department:</th>
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<tbody>
<tr>
<td>Equipment:</td>
<td>Building:</td>
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</tbody>
</table>

This audit should be completed annually for each authorized individual who performs lockout/tagout. Note that the person conducting the audit will immediately stop the process if the authorized individual is endangered.

1. Were all affected individuals notified that equipment will be shut down?
2. Was equipment shut down safely?
3. Were all sources of energy (gas, steam, pneumatic, electrical, etc.) located?
4. Were all energy isolation devices(s) locked out?
5. Was a tag(s) placed on each energy isolation device(s)?
6. Was any residual energy neutralized or bled down?
7. Were energy sources blocked or restrained?
8. Were the normal controls activated once the area is clear or verify that the equipment is dead?
9. Were the controls set in the "off" or "neutral" position?

**WORK CAN NOW BE PERFORMED**

10. Were all tools, parts, equipment removed?
11. Were all guards, shields and other safety devices replaced?
12. Were there any individuals who were exposed to a hazard?
13. Were the lock and tag removed?

**COMMENTS:**

<table>
<thead>
<tr>
<th>Supervisor or Person Conducting the Audit</th>
<th>Date</th>
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