University of Illinois at Urbana-Champaign
Facilities & Services
Division of Safety and Compliance

F&S Control of Hazardous Energy Program

February 2013
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Appendix F&S Abandoned Lock Removal Form
I. PURPOSE

Facilities & Services (F&S) at the University of Illinois at Urbana-Champaign (U of I), through the Division of Safety and Compliance (S&C), has established this Control of Hazardous Energy Program to protect the health and safety of F&S employees and to assure compliance with State and Federal occupational safety and health standards, particularly the Occupational Safety and Health Administration (OSHA) standards 29CFR 1910.147 The Control of Hazardous Energy, 29CFR 1910.333 Electrical, 29CFR 1910.269 Electrical Power Generation, Transmission, and Distribution, and enforced at the U of I by the Illinois Department of Labor.

This Control of Hazardous Energy Control Program is intended to be used in conjunction with the U of I Control of Hazardous Energy Policy. See U of I Control of Hazardous Energy Policy for definitions of terms and general requirements required on the U of I campus.

II. POLICY

It is the policy of F&S to provide its employees with a safe and healthful working environment. This is accomplished as far as feasible with acceptable work practices and administrative controls.

III. SCOPE

The provisions of this Control of Hazardous Energy Program apply to all F&S employees involved with the servicing and/or maintenance of machines and equipment in which the unexpected energization or startup, or release of stored energy could cause injury to employees.

F&S personnel working in Abbott Power Plant (APP) must be familiar with and follow the APP Out of Service, Lockout/Tagout Program.

IV. RESPONSIBILITIES

The Division of Safety and Compliance shall:
A. Develop a written Control of Hazardous Energy Program and review it on an annual basis.
B. Provide F&S shops and personnel assistance with creation of equipment-specific lockout/tagout (LOTO) procedures.
C. Assist F&S shops and personnel in the selection of appropriate equipment for LOTO.
D. Provide or assist in the arrangement of training on the requirements of the U of I Control of Hazardous Energy Policy, this Program, and LOTO procedures for supervisors and employees.
E. Retain training records and/or assist F&S divisions with establishing training record retention procedures.
F. Assist F&S shops and personnel in developing a periodic inspection system for the review of each energy control procedure (LOTO procedure).

F&S shop foreman, subforeman, and zone managers of employees who may be required to comply with this Control of Hazardous Energy Program shall:
  A. Attend training on the requirements of this Control of Hazardous Energy Program and requirements of the U of I Control of Hazardous Energy Policy.
  B. Identify personnel who require training and ensure that they have received the proper training before allowing hazardous energy control procedures.
  C. Understand and follow the protocols of the U of I Control of Hazardous Energy Policy, this Control of Hazardous Energy Program, and equipment-specific LOTO procedures.
  D. Ensure that the requirements of this Control of Hazardous Energy Program are followed.

Authorized employees shall:
  A. Attend training on the requirements of this Control of Hazardous Energy Program and requirements of the U of I Control of Hazardous Energy Policy.
  B. Know and understand the associated hazards of the equipment that they will be servicing and/or maintaining.
  C. Understand and follow the protocols of the U of I Control of Hazardous Energy Policy, this Control of Hazardous Energy Program, and equipment-specific LOTO procedures.
  D. Inform Affected employees and other employees whose work are or may be in the area where hazardous energy and material control procedures are to be utilized on the LOTO procedure to be used and to not attempt to restart or reenergize the affected equipment/machinery.

Affected employees shall:
  A. Attend training on the purpose and use of hazardous energy control procedures.
  B. Once informed by an Authorized employee that equipment/machine has been deenergized do not attempt to restart or reenergize it.

V. Control of Hazardous Energy

A. Exemptions to Requirements of this Control of Hazardous Energy Program

The following are exempt from the requirements of this Control of Hazardous Energy Program:

- Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations if they are routine, repetitive, and integral to the use of the equipment for production, provided that:
  - machine guards and safety devices do not have to be removed or bypassed;
  - body parts are not placed in the point of operation or other dangerous area during machine cycle; and
  - work is performed using alternative measures which provide effective protection.

- Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by unplugging the
equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance; and

- 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, provided that the employer demonstrates that continuity of service is essential, shutdown of the system is impractical, documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

B. Energy Control Procedures

F&S authorized employees will develop equipment-specific energy control procedures using the example form located in Appendix B of the U of I Control of Hazardous Energy Policy when work is to be completed for each piece of equipment, or for each class of related equipment that is to be serviced or maintained if an equipment-specific energy control procedure does not already exist.

An equipment-specific energy control procedure does not need to be developed when ALL of the following exist:

- The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees;
- The machine or equipment has a single energy source which can be readily identified and isolated;
- The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
- The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- A single lockout device will achieve a locked out condition;
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
- The servicing or maintenance does not create hazards for other employees; and
- F&S, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance

Application of Energy Control Devices

Prior to performing service and/or maintenance on machines or equipment, the application of energy control shall be performed in the following sequence:

1. Preparation for shutdown: Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall 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. Notification of employees: Affected employees shall be notified by the authorized employee of the application of lockout devices or tagout devices. Notification shall be given before the controls are applied to the machine or equipment.

3. Machine or equipment shutdown: The machine or equipment shall 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.

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

5. LOTO device application: The authorized employee shall place locks and/or tags in the appropriate energy isolating locations.

6. Stored Energy: Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy, such as electrical, mechanical, gravitational, and thermal, shall be relieved, disconnected, restrained, and otherwise rendered safe. This can be accomplished by:
   - Depressurizing hydraulic and pneumatic lines;
   - Discharging electrical capacitors;
   - Disengaging spring-loaded components; and/or
   - Placing blocks on moving, rotating, and elevated parts.

7. Verification of Isolation: Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished. This can be accomplished by:
   - Attempting to restart the machine or equipment following normal startup operations through the use of local controls; and
   - Using appropriate testing devices.

8. Perform service and/or maintenance work: Once complete follow the procedures for releasing a machine or equipment from lockout or tagout below.

Removal of Energy Control Devices
The following steps shall be performed in the given sequence by the authorized employee(s) for the removal of lockout or tagout devices and the restoration of energy to the machine or equipment:

1. Work area inspection: The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

2. Employee safety: The work area shall be checked to ensure that all employees have been safely positioned or removed.

3. Lockout or tagout devices removal: Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. If the employee is not available to remove it see Lock Removal Procedures Below.

4. Employee Notification: After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

Procedures for Testing or Positioning
In situations in which lockout or tagout 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 shall be followed:
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1. **Work area inspection:** The work area shall be inspected to ensure that nonessential items, including tools and materials, have been removed and to ensure that machine or equipment components are operationally intact.
2. **Employee safety:** The work area shall be checked to ensure that all employees have been safely positioned or removed.
3. **Lockout or tagout devices removal:** Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device.
4. **Startup:** Energize and proceed with testing or positioning;
5. **Deenergization:** Deenergize all systems and reapply energy control measures in accordance with the *Application of Energy Control Devices* procedures to continue the servicing and/or maintenance.

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**Protective Hardware and Materials**

**Individual Locks**
Each LOTO Authorized Employee will be assigned a personal lock(s) through the Locksmith Shop. Personal locks will be red in color, uniquely keyed to the extent feasible, and shall not be used for any other purposes. The Locksmith Shop will permanently assign a maximum of 3 locks to an individual. If additional locks are required, they can be checked out through the Locksmith Shop.

**Group Locks and Lockout Devices**
Group locks and their associated group lockout box can be checked out from the Tool Room. Group locks will be yellow in color, uniquely keyed to the extent feasible, and shall not be used for any other purposes.

**Lockout Devices**
Lockout devices can be checked out from the Tool Room and shall meet the following:
- Hold the energy isolating device in a safe or “OFF” position;
- Be red in color;
- Be substantial enough to prevent removal without the use of excessive force such as bolt cutters or other metal cutting tools;
- Be accompanied by a tagout device that identifies the employee applying the device.

Lockout devices of colors other than red can be used for non-safety related deenergization (e.g., shut down for energy conservation). The non-safety related lockouts must not use lockout locks of any color and must be accompanied by a tag indicating the reason for the equipment being off (e.g., “This valve has been turned off to gather accurate water meter readings.”) and contact information for the person or shop responsible for the deenergization.

**Tagout Devices**
Tagout devices can be checked out from the Tool Room and shall meet the following:
- When only tagout devices are used, all affected employees will be trained on the following topics: the limitations of tags; that when a tag is not to be removed without consent of the person that attached it; and that a tagout device is never to be by-passed, ignored, or otherwise defeated;
• Tags must be legible and understandable and attached in a manner that will clearly indicate the safe or “off” position;
• Tags, and means of attachment, must be made of materials which will withstand the environmental conditions of the workplace;
• Tagout devices (devices used to connect tags) shall be non-reusable, attached 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; and
• Be substantial enough to prevent inadvertent or accidental removal.

**Removal of Lockout/Tagout Devices**
Lockout/tagout devices shall only be removed by the individual that applied the device unless it has been verified that the employee who applied the device is not on campus. Only the employees Foreman, Subforeman, or Foreman/Subforeman designee shall remove the lockout/tagout device by cutting it off. The *Abandoned Lock Removal Form* located in the Appendix must be completely filled out before removing the lockout/tagout device. All reasonable efforts shall be made to inform the employee that their lockout/tagout device has been removed and the employee must be informed prior to beginning work upon their return to campus.

**Work With Contractors**
When work is conducted between F&S and a contractor(s) F&S will assign a coordinating authorized employee will be the lead authorized employee on the project and responsible for all work being conducted. The F&S coordinating authorized employee will apply a hasp to each lockout point on the equipment or machine. Each entity must:
• Have and follow their own control of hazardous energy and materials program;
• Inform F&S of their energy control procedures and F&S must inform contractor of energy control procedures;
• Comply with restrictions and prohibitions of this Control of Hazardous Energy Control Program and F&S must comply the restrictions and prohibitions of the contractor’s energy control program;
• Provide appropriately qualified and trained authorized employees;
• Provide the appropriate group and individual lockout equipment;
• Assign a coordinating authorized employee who will:
  o Be directly responsible for the authorized employees that work for their entity;
  o Work with the other coordinating authorized employees to make sure that the requirements of their own program are met; agree on the proper procedures for shutdown, isolation and deenergization, and reenergization; verify that hazardous energy has been isolated and de-energized; and ensure that all authorized and affected employees are aware of reenergization;
  o Apply a group lock on the hasp at each lockout location and place the group lock keys in their own group box; and
  o Verify that each authorized employee working for their entity places an individual lock on their own group box.
Reenergization of the equipment or machine cannot occur until each individual lock on each group lock box has been removed and each group lock has been taken off of the hasp at each lockout location. The F&S group lock applied by the F&S coordinating authorized employee shall be the last group lock removed.

**Contractor Work**
Contractors shall have and follow their own control of hazardous energy program and procedures. Contractors must provide their own authorized employees and equipment to safely isolate and de-energize hazardous energy and materials, and verify that isolation and deenergization was successful. Contractors are responsible for informing all affected F&S and other University employees of the equipment or machine work. F&S will provide the Contractor with the known energy sources, lockout locations, and equipment-specific procedures including procedures for lockout, shutdown, and startup.

**Group Lockout/Tagout**
Group lockout/tagout is required when service or maintenance on a machine or equipment will be conducted by more than one person. Two procedures for conducting group lockout/tagout are described below.

**Procedure 1**
A hasp designed to accept multiple locks is affixed to each lockout point on the affected machine or equipment. Each person conducting work must place individual locks and tags on the hasp at each lockout point. Each person must also verify that hazardous energy has been isolated and de-energized.

**Procedure 2**
Group lockout/tagout can also be accomplished using group locks and lockout boxes available through the F&S Toolroom. Group locks and lockout boxes shall be used in accordance with the following:

- When one crew or trade is involved, a single responsible authorized employee from the group shall:
  - be assigned primary responsibility for the employees working under the protection of the group lockout/tagout;
  - ascertain the exposure status of each individual group member with regard to the locked out/tagged out machine/equipment;
  - affix the designated group locks at each lockout point on the affected machine or equipment, place the group lock keys in the lockout box, and affix an individual lock and tag to the lockout box;
  - verify that hazardous energy has been isolated and de-energized; and
  - verify that each individual group member has placed their individual lock and tag on the lockout box prior to beginning work, verified that hazardous energy has been isolated and de-energized, and removed their individual lock and tag when their work has been completed;

- When more than one crew or trade is involved a coordinating authorized employee:
  - shall be assigned with overall job-associated lockout/tagout control responsibility;
shall coordinate with the responsible authorized employee from each crew or trade to ensure continuity of protection; and
will place an individual lock on the lockout box and coordinate reenergization and start-up with each of the responsible authorized employees.

- Use LOTO release any time the lockout box needs to be opened during the servicing work, such as testing motor rotation. Clear all workers from the equipment and worker locks off the lock box. When release is complete, restore isolation of energy sources;

- Once maintenance or service work is complete:
  
  - all workers will remove their individual locks and tags from the lock box; and
  
  - the responsible authorized employee(s) and coordinating authorized employee, if required, shall inspect the work site and machine/equipment, and then remove their locks from the lock box and the group locks from the machine/equipment lockout points, and re-energize the machine/equipment according to the manufacturer recommended startup guidelines.

- Specific written procedures must be developed and implemented for complex isolation systems or repair operations involving many workers over more than one work shift.

**Shift/Personnel Changes**

If a shift or personnel change occurs for work on equipment or a machine is locked out/tagged out the following steps shall be followed:

- Authorized employees taking over the service or maintenance work will apply their locks or tags prior to the removal of locks or tags by the authorized employees ending their work;
- Authorized employees ending their work will provide a detailed summary of all work that has been completed and sources that may have been re-energized for testing to the authorized employees taking over the work prior to leaving the work area; and
- Authorized employees taking over the service or maintenance work must re-verify that all sources of hazardous energy have been isolated and de-energized.

**Motorized Equipment with Key Ignition**

F&S personnel who perform service and/or maintenance work on motorized equipment with key ignitions (e.g., automobiles, tractors, forklifts, etc.) shall:

be trained as authorized employees, remove and maintain sole possession of the ignition key by the authorized employee additional steps that must be taken include:

- Be trained as authorized employees;
- Remove and maintain sole possession of the ignition key;
- Set the parking brake;
- Place a tagout on the steering wheel or lock the doors; and
- Disconnect the negative battery cable if startup is possible without the key.

Other sources of hazardous energy, such as hydraulic pressure and springs, must also be isolated or dissipated prior to commencing service or maintenance work.
C. Employee Training

**Authorized Employees**
S&C shall provide training for Authorized Employees that covers general application of LOTO including:

- Recognition of hazardous energy sources;
- The type and magnitude of the energy available in the workplace;
- The methods and means available for energy isolation and control;
- Limitations of tagout only usage; and
- Requirements of the U of I Control of Hazardous Energy Policy and this Control of Hazardous Energy Program.

Shop foreman, subforeman, zone managers, or their designee shall provide additional training specific to the equipment that the employee will be servicing and/or maintaining including:

- Recognition of hazardous energy sources;
- The type and magnitude of the energy available in the workplace;
- The methods and means available for energy isolation and control; and
- Equipment-specific LOTO procedures that may be utilized.

**Affected Employees**
Prior to beginning service and/or maintenance work F&S personnel shall identify affected employees and provide/verify the following information:

- Verify the affected employee has documentation of having received affected employee training; or
- Provide a copy of the Affected Employee Training and Record Form located in **Appendix D** of the U of I Control of Hazardous Energy Policy and verify affected employees acknowledgement of the information; and
- Provide instruction on the energy control procedure to be utilized.

**Other Employees**
All other employees whose work are or may be in the area where energy control procedures may be utilized shall be instructed by the authorized employee on the procedure and to not attempt to restart or reenergize affected equipment/machines.

**Retraining**
Retraining is required for affected and authorized employees when:

- Job duties regarding LOTO change;
- There are new or revised energy control procedures;
- There is a change in machines, equipment or processes that present a new hazard;
- There is a revision to the U of I Control of Hazardous Energy Policy or this Control of Hazardous Energy Program;
• Periodic inspection reveals, or a supervisor has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

D. Periodic Inspections

F&S will conduct annual periodic inspections using the Periodic Inspection Form located in Appendix E of the U of I Control of Hazardous Energy Policy. Management of the periodic inspections will be done by the F&S Maintenance Division for the facilities that contain equipment/machines serviced by the F&S Maintenance Division and by the F&S Construction Management Division for facilities that are contain equipment serviced by the F&S Construction Management Division.

Maintenance Zone Managers and Shop Foreman will assign personnel to the Authorized Employee and Observer roles. The Observer shall observe the implementation of the energy control procedure performed by a representative number of Authorized Employees authorized to perform service/maintenance work using the energy control procedure and talk with a representative number of Authorized Employees authorized to perform service/maintenance work using the energy control procedure to review the procedure and their responsibilities under it.

Upon completion of a periodic inspection, the completed Periodic Inspection Form shall be provided to S&C along with recommendations for retraining or edits to the energy control procedure. Results of the periodic inspection shall be communicated to each Authorized Employee reasonably expected to implement the procedure during the year by the Maintenance Zone Managers and Shop Foreman.

VI. Electrical Work Practices

Isolation, discharge, and verification of electrical hazards from work on, near, or with conductors or equipment in electric utilization installations (e.g., replacing the electrical disconnect for a fan) shall only be performed by a qualified electrician according to the procedures included in Section VII, Electrical Work Practices of the U of I Control of Hazardous Energy Policy.

VII. Electrical Power Generation, Transmission, and Distribution

Work on installations under the exclusive control of electric utilities for the purpose of power generation, transmission, and distribution, including related equipment for communication or metering shall be conducted by qualified employees assigned to perform F&S Utilities work. Work shall be conducted in accordance with Section VIII, Electrical Power Generation, Transmission, and Distribution of the U of I Control of Hazardous Energy Policy.
APPENDIX: F&S ABANDONED LOCK REMOVAL FORM
Only Foreman, Subforeman, or their designee can authorize the removal of locks. All lock removals must be approved by Safety and Compliance.

Building ____________________________  Building No. ________________
Equipment Description __________________ Location __________________
Requested By ________________________ Date ______________________

Name of Person whose lock must be removed: __________________________________

Has an attempt been made to contact him or her? □ YES □ NO

Describe Steps taken to contact him/her.
________________________________________________________________________
________________________________________________________________________

Why is it critical to remove this lock now?
________________________________________________________________________
________________________________________________________________________

Are you sure it is safe to remove this lock? □ YES □ NO

Authorized By: _______________________________ UIN/Badge: ________________
Signature: _________________________________
Date: ______________________

S&C Representative: ___________________________ UIN/Badge: ________________
Signature: _________________________________
Date: ______________________

The lock owner must be informed of removal of their lock upon their return to work. Have the lock owner complete the section below verifying that they have been notified and return completed form to S&C.

Lock Owner: _______________________________ UIN/Badge: ________________
Signature: _________________________________
Date: ______________________