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APPENDIX D
Lockout/Tagout Training
I. PURPOSE AND SCOPE

A. Purpose: The purpose of this lockout/tagout program is to assure that any individual setting up, adjusting, repairing, servicing, installing or performing maintenance work on equipment, machinery or processes is protected from unintended release of energy or machine motion which could cause injury.

B. Scope: Servicing and maintenance of machines and equipment in which the unexpected energization or start up, or release of stored energy could cause injury to employees.

II. DEFINITIONS

A. Affected Employees - An employee whose job requires him/her to operate or use equipment on which servicing or maintenance is being performed, or whose job requires him or her to work in an area in which such servicing is being performed.

B. Authorized Employee - An employee who locks or implements an lockout/tagout procedure on equipment or processes to perform maintenance or servicing.

C. Energy Isolating Devices - A physical device that 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, a slide gate, a slip blind, a line valve and similar devices with a visible indication of the position of the device (Note: push buttons, selector switches, and other control circuit type devices are not energy isolating devices).

D. Energy Sources - Energy is defined as movement or the possibility of movement. Potential sources are: electrical, mechanical, hydraulic, pneumatic, chemical, thermal and gravitational.

E. Regulated Low Voltage Electrical Equipment - Equipment energized with 50-600 volts to ground.

F. Lockout Device - A device that utilizes a lock and key to hold an energy isolating device in a safe position and prevent the inadvertent energizing of equipment for the purpose of protecting personnel.

G. Lockout/Tagout - The placement of a lock and/or tag on the energy isolating device in accordance with an established procedure, ensuring that the energy isolating device cannot be operated until the removal of the lock/tag. The term lockout/tagout allows the use of a lockout device, tagout device, or combination of both.

H. Unregulated Low Voltage Electrical Equipment - Equipment energized with less than 50 volts to ground.

I. Primary (High) Voltage Electrical Equipment - Equipment energized with more than 600 volts to ground.
J. **Qualified Employee** – One familiar with and knowledgeable of the construction, installation, operation and hazards of the equipment, the specific duties and tasks performed, by means of skills, experience, training, or technical knowledge. A person can be considered qualified to conduct certain duties or tasks on certain types of equipment or installations, but unqualified to conduct other duties or tasks on the same or other types of equipment and installations.

K. **Servicing and/or Maintenance** - Workplace activities such as construction, installing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

L. **Tagout Device** - A prominent warning device, that is capable of being securely attached and that, for the purpose of protecting personnel, forbids the operation of an energy isolating device. As a minimum, the tag shall indicate the name of the authorized employee, the equipment or installation of the equipment affected, the date, the reason for tagout, and the estimated duration of down time.

**III. POLICY**

A. Only authorized employees shall be allowed to perform lockout/tagout procedures.

B. Prior to setting up, adjusting, repairing, servicing, installing or performing maintenance work on equipment, machinery or processes, the proper lockout/tagout steps per this program shall be taken to assure that employees are not exposed to hazards due to unintended machine motion or release of energy.

C. All authorized employees shall receive training in the recognition of the applicable hazardous energy sources and in the use of adequate methods and means of their isolation. Each authorized employee shall be instructed in the purpose and use of hazardous energy control procedures (i.e., lockout/tagout) including an awareness of this program.

D. This program will be evaluated annually to determine and correct deficiencies. Any changes, modification, additions or deletions to the program will be recorded and archived.

E. Authorized employees that perform lockout/tagout procedures must be evaluated annually as to their ability to adequately perform lockout/tagout procedures.

F. Re-training shall be provided to authorized employees when there is a change in job assignment, machines, or processes that present a new hazard, when there is a change in energy control procedures, or whenever the authorized employee cannot adequately demonstrate the ability to perform lockout/tagout procedures.
IV. PROCEDURE

A. Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this program.

B. Documentation of procedures for the isolation and control of hazardous energy sources is required.

EXCEPTION: Employees need not document required procedure for a particular machine or piece of equipment when all of the following elements exist:

1. The machine/equipment has no potential for stored energy or re-accumulation of stored energy after shutdown which would endanger employees.

2. The machine/equipment has a single energy source that can be readily identified and isolated.

3. The isolation and locking out of the energy source will completely de-energize the machine/equipment.

4. The machine/equipment is isolated from that energy source and is locked out during servicing or maintenance.

5. A single lockout device will achieve a locked out condition.

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

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

8. There have been no previous accidents involving the unexpected activation or re-energization of the machine being locked out/tagged out during service or maintenance.

C. Documentation for non-exempted hazardous energy sources shall consist of a written procedure and/or schematics identifying points of lock out tag out using the Lockout/Tagout Procedure Identification Form in Appendix B, or a similar form.

D. General Requirements: Lockout/Tagout application and removal procedures will generally conform to the procedures outlined below. Individual units are authorized to create more specific procedures as needed, based on the location or specific circumstances of the situation, as long as the minimum requirements of the procedures below are achieved.

1. Lockout/Tagout Device Application.
   a. Before any piece of equipment or machine is shut down the authorized employee shall notify the affected employees, supervisor(s) and administrator(s) of the affected areas. In many
cases advance notice of the shutdown must be given and approval received.

b. Before an authorized employee shuts down a machine or piece of equipment, that employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the correct lockout/tagout procedures.

c. The machine or piece of equipment shall be shut down using the procedures established for that piece of equipment. An orderly shutdown must be utilized to avoid any additional or increased hazards to employees as result of the equipment stoppage.

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

e. The appropriate lockout/tagout devices shall be applied to the device by each authorized employee working on the equipment or process. The authorized employee shall utilize lockout/tagout, unless the hazardous energy source cannot be locked out and the supervisor shows that tagout only will provide the same level of protection. In this case, tags shall be supplemented with additional safety measures where feasible, such as removal of isolating circuit element, blocking a control switch, opening extra disconnect device or opening a valve handle.

f. When tagout systems are used, employees shall be trained in the following limitations of tags: when a tag is attached to an energy isolating means; it is not to be removed without authorization of authorized person responsible for it; and it is never to be by passed, ignored, or otherwise defeated.

g. Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations may be in the area.

h. Tags and their means of attachment must be made of materials which will withstand the environmental conditions of the workplace.

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

j. Lockout devices shall be attached to the energy isolating devices to prevent unintended re-activating of the energy isolating device and to meet the following requirements:

1. Lockout devices shall be attached in such a manner so as to hold the energy isolating devices in a safe position.
2. Lockout devices shall be standardized in at least in one of the following criteria: color, shape, or size and additionally, in the case of tags, print and format.
(3) Lockout devices shall be substantial enough to prevent removal without the use of excessive force (e.g., bolt cutters).

(4) Lockout and tag out devices shall indicate the identity of the employee applying the device.

k. Following the application of lockout/tagout devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, and otherwise rendered safe.

l. Prior to starting work on equipment that has been locked or tagged out, the authorized employee shall verify that isolation and de-energization of that machine has been accomplished.

2. Lockout/Tagout Device Removal.

a. Before lockout/tagout devices are removed:

   (1) Authorized employees shall ensure that non-essential items such as tools and materials have been removed from the work area.
   (2) Ensure that equipment/machine components are operationally intact.
   (3) All employees are at a safe distance from the affected machine or equipment.
   (4) Affected employees, supervisors and administrators are notified that equipment/processes are going to have the lockout/tagout devices removed.

b. Lockout/tagout devices shall be removed from each energy isolating device by the authorized employee who applied the device.

   EXCEPTION: If the authorized employee that applied the lockout/tagout device to the machine or equipment is not available to remove the lock/tag, then the authorized employee’s supervisor may remove the lockout/tagout device after:

   (1) Verifying that the authorized employee applying the device is not at the facility;
   (2) Making all reasonable effort to contact the authorized employee to inform them that their lockout/tagout is going to be removed; and
   (3) Ensuring that the authorized employee that applied the device will be properly informed that the lockout/tagout has been removed upon returning to work.

c. Once all lockout/tagout devices have been removed, affected employees, supervisors and administrators will be notified that the lockout/tagout devices have been removed and that the machine or equipment is going to be re-energized.
E. Special Requirements.

1. Group Lockout/Tagouts.
   
   a. When servicing and/or maintenance on a machine or equipment is performed by more than one person, then group lockout/tagout devices can be used to provide protection to all authorized employees. Each authorized employee shall have their own lock/tag as part of the group lockout/tagout device. The machine or equipment locked out/tagged out shall be incapable of being re-energized until all individual locks/tags of each authorized employees has been removed according to Section D.2. above.
   
   b. Primary responsibility for the entire group’s lockout/tagout protection shall be given to one authorized employee.
   
   c. The authorized employee with primary responsibility shall be able to ascertain the exposure status of each individual authorized employee within the group with regard to the locked out/tagged out device. When more than one group of authorized employees are working on a machine or equipment, the authorized employee with primary responsibility must be able to coordinate between groups and ensure the continuity of protection for all authorized employees in each group.

2. Shift or Personnel Changes.

   When work on a locked out/tagged out machine or equipment continues on through a change in authorized employees servicing and/or maintaining the machine or equipment, the authorized employees continuing to service and/or maintain the machine or equipment will apply their lockouts/tagouts prior to the removal of the lockouts/tagouts of the authorized employees ending their service and/or maintenance on the machine or equipment. At no time will all lockouts/tagouts be removed from a machine or equipment without first going through the procedures listed in Section D.2. above.

3. Unregulated Low Voltage Electrical Isolation

   a. Energized parts that operate at less than 50 volts to ground need not be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs. Energized parts to which an employee may be exposed shall be de-energized before the employee works on or near them, unless the supervisor approves and can demonstrate that de-energizing introduces additional or increased hazards or is not feasible due to equipment design or operational limitations. If this is the case the qualified employee will follow general electrical safety practices.

   b. Only qualified employees may work on or near electric circuit parts or equipment that have not been de-energized. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques,
personal protective equipment, insulating and shielding materials, and insulated tools (see Electrical Safety Program).

c. In addition to the requirements of Section D above and Subsection 4 below, when de-energizing electrical devices, the authorized employee performing the work shall:

(1) Test circuit or equipment to ensure power is de-energized.
(2) Lockout/tagout isolation devices on affected equipment or circuit, at both ends if necessary.
(3) Ensure that all equipment guarding panels are installed prior to removal of lockout/tagout devices.

4. Primary (High) Voltage Electrical Equipment Isolation

In addition to the requirements of Sections D and E, the following steps must be taken when isolating primary voltage electrical equipment:

a. All primary voltage electrical equipment switching shall be performed by at least two (2) qualified employees. Examples of acceptable qualified employees for these tasks are:

(1) Two (2) high voltage electricians.
(2) One (1) high voltage electrician and the high voltage foreman.
(2) One (1) electrician under the direct supervision of the high voltage foreman or the chief electrical foreman.
(3) In the case of a secondary main(s) shutdown, one (1) high voltage electrician and one (1) electrician.

b. No one other than high voltage electricians will lockout/tagout or operate primary voltage equipment or remove lockout/tagout devices, up to and including secondary main(s).

c. A written step-by-step switching order shall be approval by either the high voltage foreman or chief electrical foreman, or in the case of neither being available, 2 qualified employees on site shall mutually approve a switching order (as described in the examples in Subsection 4.a. above).

5. Compressed Gases or Air

The presence of several compressed gas and air systems present significant health and physical hazards. Thus, the lockout/tagout policy pertains to the associated hazards and are covered under this section.

a. Compressed gas pressure systems will be included in this section and are required to be locked out/tagged out if pressures could result in unexpected movement of the equipment or components.

b. Equipment using air or other compressed gas must be equipped with a main line shut off valve. This valve must have the capability of being locked out or tagged out in the "off" position.
c. Unless the compressed gas valve allows pressure release, a portion of the pipe shall be disconnected to allow pressure release if the trapped energy could create a possible hazard to affected personnel.

6. Hydraulic Energy

Equipment using hydraulic pressure shall be locked out by placing the hydraulic pump motor electrical disconnect switch in "OFF" position, applying a lock/tag to the disconnect, and bleeding off residual pressure in the piping system if the energy could endanger people.

7. Gravity and Stored Energy

a. Regardless of the power lockout/tagout procedure used, safety blocks or the mechanical devices shall be used as required to protect the employee from accidental equipment movement.

b. It is necessary to bleed off or otherwise dissipate residual pressure in steam, air, gas, and hydraulic systems.

V. RESPONSIBILITIES

A. Management Responsibilities

1. Each supervisor or designated individual shall train new employees and periodically instruct all of their employees regarding provisions and requirements of this lockout/tagout procedure. Training records shall be kept in accordance with the Safety Training Program.

2. Each supervisor shall effectively enforce compliance of this lockout/tagout procedure including the use of corrective disciplinary action when required. Compliance shall be enforced by annually evaluating authorized employees’ use and knowledge of the lockout/tagout procedures. Written verification of this audit function shall be documented on site and records shall be kept by the designated departmental safety coordinators or that authorized employee's immediate supervisor. If deficiencies are found then re-training of that individual is required.

3. Each supervisor shall ensure that the devices required for compliance with the lockout/tagout procedure are provided to their employees and meet the requirements outlined within this program.

4. Prior to setting up, adjusting, repairing, servicing, installing or performing maintenance work on equipment, machinery or processes, the supervisor shall determine and instruct the employees of the steps to be taken to assure they are not exposed to injury due to unintended machine motion or release of energy.

5. Each supervisor shall promptly investigate, report, and inform OSEH and the Risk Management Department of all on the job accidents and/or job related health problems and request medical treatment if required.
6. All contractors hired by Plant Operations that will be working on or near areas affected by this policy will be provided a copy of this program and documented by filling out the Contractor Notification form located in Appendix A of this policy. A copy of this form shall be kept by the project manager who is responsible for the work to be performed by the contractor. Examples of areas where notification would be required include: central campus utility tunnels; Central Power Plant; elevator rooms; electrical vaults; and building roof tops.

B. Employee Responsibilities

1. Employees shall comply with this lockout/tagout procedure.

2. Employees shall consult with their supervisors or other appropriate knowledgeable management personnel whenever there are any questions regarding their protection.

3. Employees shall obtain and care for the locks and other devices required to comply with the lockout/tagout procedure.

4. Employees shall report any job related injuries or illness to the supervisor and seek prompt medical treatment.

5. Employees shall refrain from the operation of any mechanical or electrical equipment without both proper instructions and authorization.

6. Employees shall identify hazardous energy sources that require specific documented procedures per this policy Section IV Part B.

C. Occupational Safety and Environmental Health (OSEH)

1. The OSEH Rep. for Plant Ops will provide technical assistance, when called upon, and inspect job sites.

2. Provide training, as necessary.
APPENDIX A
University of Michigan
Contractor Lockout/Tagout Notification Form

Project Identification: ___________________________________________

Description of Work: ___________________________________________

U of M Project Representative: __________________________________________
U of M Department: ___________________________________________

Contractor Representative: __________________________________________
Contractor Company Name: __________________________________________

To be filled out for all projects:

I have supplied a copy of the Hazardous Energy Control Program (Lockout/Tagout Program) for ________________ (company name) to the University of Michigan. While on University of Michigan properties, our employees shall understand and comply with the restrictions and prohibitions of this energy control program and ensure that all University employees affected by this program comply with it’s restrictions and prohibitions.

Signature of Contractor Representative: __________________________________________
Printed Name of Contractor Representative: __________________________________________
Title: __________________________________________
Date: __________________________________________

Signature of U of M Project Manager: __________________________________________
Printed Name of U of M Project Manager: __________________________________________
Title: __________________________________________
Date: __________________________________________

The U of M project Manager receiving the Contractor’s Lockout/Tagout Program must forward a copy of this program to OSEH for review prior to implementing the procedures of the program.
APPENDIX B
LOCKOUT/TAGOUT PROCEDURE FORM

DEPARTMENT: __________________
MACHINE/EQUIPMENT: __________________

1. Who should be notified of shut down (supervisor in area, affected employees, etc.): ______________

2. State the shut down procedure. Identify each source of energy and how it is shut off:

3. Describe specific techniques for isolating, blocking, bleeding, etc., the energy sources:

4. Describe placement of lockout/tagout devices (diagrams may be useful):

5. Describe verification procedure that tests machine to assure it is locked out, and there is no residual energy stored, e.g., cycling of machine, release of stored energy, etc.

6. State specific lockout/tagout device removal and machine start-up procedure. General procedure: removal of all nonessential items from around the machine; inspection of machine to ensure it is operationally intact; safe clearance distances, if applicable; removal of lockout/tagout devices; notification to supervisor and affected employees of lockout/tagout removal and equipment start-up.

PROCEDURE IDENTIFICATION INSTRUCTIONS

Include the following items when writing lockout/tagout procedures for each machine or piece of equipment:

1. Who should be notified of shut down (supervisor in area, affected employees, etc.).
2. The shut down procedure. Identify each source of energy on the machine and how it is shut off and locked out.
3. Describe specific techniques for isolation, blocking, bleeding, etc.
4. Describe placement of locks or tags (diagrams may be useful).
5. Describe verification procedure that tests the machine to assure there is no residual energy (cycling of machine, release of stored energy, etc.).
6. Removal of locks/tags and start up procedure. Include the following:
   - removal of all nonessential items from around the machine
   - inspection of machine to ensure it is operationally intact
   - safe clearance distances, if applicable
   - removal of locks/tags
   - notification to supervisor and affected employees of lock/tag removal and start up
   - start up procedure or sequence
APPENDIX C
Central Power Plant Tagout - Lockout procedure.

**Definition:** All energy isolating devices that control the energy to a machine or piece of equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from energy sources. If an energy isolating device is not capable of being locked out, the employer’s program shall use a tagout system. If an energy isolating device is capable of being locked out, the employer’s shall use lockout system.

When a piece of equipment or system is to be taken out of service for inspection, repair or overhaul it will be made safe and tagged out by the operations department in the following manner.

1) The Senior Shift Engineer (the primary responsible authorized employee) will be notified by a supervisor of precisely what is to be worked on and how long it is expected to be down. A job briefing shall be conducted with all persons assigned to accomplish the work. This job briefing shall cover at least the following subjects: hazards, associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment requirements. Additional job briefings shall be held if significant changes, which might effect the safety of the employees, occur during the course of the work.

2) The Primary responsibility shall be vested in an authorized employee (duty Senior Shift Engineer) for a set of employees working under a protection of a group lockout or tagout device (such as an operations lock). The Senior Shift Engineer will either tagout the equipment himself or assigns an operator to do so.

3) The operator that will be tagging out the equipment will do so by first recording on the index sheet of the tagout log what equipment will be tagged out and why. He will also assign an index number for the shut down.

4) The operator will then sign date and write on a red tag, what the index and tag numbers are and record the tag number in the shut down section of the tagout log. Here it will be noted where the tag is to be placed and what position the valve or breaker was in before the shut down and what position it will be in after the shut down.

5) There has been a place provided at the bottom of the Tagout log sheet for comments. This space is to be used for any and all conditions that need explanation. (i.e.: a yellow tag has been place on xxx for xxx, see xxx before returning to service, etc.)

6) It will be the responsibility of the Senior Shift Engineer to confirm the shut down and the tagout procedures are done in a timely manner before the equipment is turned over to the person or persons working on the equipment.

7) When the Senior Shift Engineer assigns a person or persons to do a shut down, this means that this person is responsible for the safe and effective shut down of that particular piece of equipment and or system, and that the Senior Shift Engineer is responsible to see that the shut down has been completed and duly noted in the tagout log and operations log. The operator that has completed the shutdown is required to insure that all conditions are safe before turning over to the maintenance personnel, i.e. all pressure is relieved and/or the system is completely drained etc; if this cannot be visually verified then supervision must be notified of the condition.

8) Each responsible group will be issued locks that are keyed separately and color-coded for that group.
   a) Operations - Red
b) Maintenance Repair - Blue

c) Maintenance Relief - Orange

d) Instrument Department - Green

9) When a piece of equipment is shut down, it is the responsibility of the Operator doing the work to verify the shutdown and request additional shutdown if he feels it necessary for additional safety for the work that needs to be performed.

10) When a gang locking device is provided, all persons working on the equipment should have a lock representing themselves on that lock point, until they have completed their job and are clear of the equipment.

11) Note: It will be left to the discretion of supervision to make the decision to fill out the tagout log if the system/or equipment will only be down for a period of time that will not exceed the shift for that day. If the equipment/or system is still down when the operator that tagged it out is relieved or goes home for any reason, he will fill out a tagout index and shut down sheet.

12) It is the responsibility of the individual(s) that is performing the work to insure that the system is safe before continuing.

Additional Requirements

1) Procedures shall be used during shift or personal changes to ensure the continuity of lockout or tagout protection, including provisions for the orderly transfer of lockout or tagout device protection between off-going and on-coming employees.

2) Each lockout or tagout device shall be removed from the energy isolating device by the authorized employee who applied the lockout or tagout device. However, if that employee is not available to remove it, the device may be removed under the direction of the supervisor, provided:
   a. Verification by the supervisor that the employee who applied the device is not at the facility,
   b. Making all reasonable efforts to contact the employee to inform him or her that his or her lockout or tagout device has been removed; and
   c. Ensuring that the employee has this knowledge before he or she resumes work at the facility.

3) A copy of this procedure and the Lockout/tagout logs will be on file in the operations control room.

The following is the procedure for clearing a piece of equipment or system after it has been worked on.

1) A supervisor, or the person or persons who have completed the work on the equipment will notify the Senior Shift Engineer that the equipment is ready to be returned to service.

2) The Senior Shift Engineer will confirm that the equipment is safe and clear of any personnel or hazards before lining it back up. He may assign an operator or a maintenance person to do the lineup.

3) After the equipment is put back into service, the person that did the line up will clear the tagout log by indicating the condition of the valve(s) and/or breaker(s) after the tagout has been cleared or it has been returned to service. The Senior Shift Engineer will be notified of the condition of the shutdown.

4) It will be the responsibility of the person assigned by the Senior Shift Engineer to see to it that the equipment was lined up correctly and completely.
5) After the equipment has been put back into service the Senior Shift Engineer will clear the tag log sheet by placing it in the back of the tagout log in the completed section and noting in the operations log.

**Question Answer Section**

1. Q: Who is responsible to insure that a piece of equipment and/or system is safe to be worked on?  
   A: The individual that completed the tagout and the person doing the work.

2. Q: Who is responsible in determining if the lockout / tagout log needs to be implemented?  
   A: Supervision.

3. Q: What are the color codes for the various locks used in the CPP tagout system?  
   A: **Red**-Operations, **Blue**-Maintenance, **Green**-Instrumentation, and **Blaze Orange**-Relief’s.

4. Q: Who is responsible for clearing a tagout log after work has been completed?  
   A: The Senior Shift Engineer

5. Q: What is the minimum information that should go on a tag?  
   A: Signature, Date, Index number, and tag number.

6. Q: Who is responsible to insure that the tagout is completed?  
   A: The Senior Shift Engineer.

7. Q: Who is the primary responsible authorized employee?  
   A: The Senior Shift Engineer.

8. Q: Who is responsible to insure that a piece of equipment and/or system is safe to be worked on?  
   A: The individual that completed the tagout and the person doing the work.

9. Q: Who is responsible in determining if the lockout / tagout log needs to be implemented?  
   A: Supervision.

10. Q: What are the color codes for the various locks used in the CPP tagout system?  
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13. Q: Who is responsible to insure that the tagout is completed?  
    A: The Senior Shift Engineer.

14. Q: Who is the primary responsible authorized employee?  
    A: The Senior Shift Engineer.
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1. Each electrician will have a personal LOTO kit consisting of:
   a) 6 Personal LOTO locks with one personal key.
   b) Various LO devices.
   c) 6 multiple lock LO hasps.
   d) Several NFPA 70E compliant TO tags (These can be purchased at Madison).
   e) Several “Out-of-Service” locks keyed to the M6600 Shop lock XA851.

2. Each electrician will keep his/her personal LOTO kit in their vehicle or with them during all working hours (must be readily accessible). Each electrician will be responsible for maintaining their kit (Supervisor will supply all necessary materials; tags can be obtained from Madison Electric by electrician).

3. This procedure is M6600 department specific procedure and will work together with OSEH’s LOTO official policy as distributed (until OSEH presents a revised procedure).

4. Lock out all sources of electrical energy according to the following procedures (The person applying the tag and “out of service” lock will be the authorized employee):
   a) Apply a multi-lock hasp to the disconnecting device.
   b) Apply an “Out-of-Service” lock to the hasp.
      i. The “Out-of-Service” lock does not serve as a LO lock. It serves only to supplement the tag in keeping equipment out of service when authorized staff are not working on the equipment. The “Out-of-Service” lock will be keyed to the M6600 Shop lock XA851.
   c) Apply an NFPA 70E compliant tag to the hasp. The tag must contain the following information (see pictures for detail):
      i. The name of the person applying the tag.
      ii. The shop phone number and radio channel of the person applying the tag.
      iii. A brief description of the reason for the LOTO procedure on the tag reverse.
      iv. The date of tag application.
      v. Apply all information with your printer/labeler per pictures below. Do not fill-in information freehand. Tags may be re-used by simply adding new labels over old.

Front:  
Reverse:
d) Apply personal LO lock. Your personal lock must be applied to the hasp whenever you are working on the equipment and must be removed when you are leaving the project for the day. A personal lock will not remain on the hasp when the lock’s owner has left for the day or has left the project for another assignment. However, the “Out-of-Service” lock will remain on the hasp as long as the equipment is to remain out-of-service. Each and every person working on the equipment must apply their own personal lock while they are working on the equipment. Each and every person should remove their personal lock when they have left for the day or have left the project for another project. Add more hasps as required for multiple personnel.

e) Apply this procedure to all sources of energy.

f) When work is completed and before LOTO devices are removed:
   i. Remove all tools, materials, safety grounding devices, debris, etc. from work area.
   ii. Check equipment for operational, electrical, and mechanical completeness and correct functionality.
   iii. Notify and confirm with all affected personnel plan to remove LOTO devices and re-energize.
   iv. Assure all personnel are clear of affected area.
   v. All employees shall remove their personal LO lock.
   vi. The authorized employee that placed the original tag and “out of service” lock shall remove these devices.
   vii. If the authorized employee is absent and LOTO devices must be removed:
       1) Verify that the authorized employee is not at work and available to remove the devices.
       2) Contact your supervisor for authorization to remove LOTO devices.
       3) Notify the original authorized employee of the LOTO removal when he/she returns from absence.
APPENDIX D
Lockout/Tagout Training

OBJECTIVE
To understand the need to control energy sources during maintenance and service operations, and to understand lockout/tagout procedures.

SUGGESTED MATERIALS TO HAVE ON HAND
- Locks and lockout/tagout devices used by your workers
- Lockout/tagout training video
- If possible, a machine or piece of equipment your workers will have to lockout
- All written Lockout/Tagout Procedure Identification forms for machines and equipment you’re responsible for servicing or maintaining.

INTRODUCTION
The standard method of protecting workers around machinery is by using guards to keep the worker away from the dangerous parts. But during maintenance and service operations, the guards are either removed or bypassed to get access to the machine. When this happens, workers are exposed to hazards not normally associated with this equipment. The idea behind lockout/tagout is to physically padlock a machine in a safe position and give control of the key to the worker. Proper lockout procedures give each worker doing the service positive control of the machine’s energy sources, so equipment will not start running unless all workers are in a safe area.

The only difference between lockout and tagout procedures is that tagout uses a durably attached tag instead of a lock. Since a tag can be more easily removed than a lock, workers have to depend on others to recognize the significance of the tag and not remove or ignore it. Because of this limitation, lockouts should be used whenever possible. Typically, tagout procedures are only used by utility workers, where the number of different power sources makes the use of locks prohibitive, and access to the location of the tagouts is usually controlled.

HAZARDS
Most lockout/tagout related accidents involve moving machinery, electrical equipment, or vehicles. The main reasons for these accidents are:
- The machine was not completely shut off before work began. If a machine is still connected to it’s power source (electricity, for example), then locking out the start switch will only provide limited protection.
- The machine was turned on, either accidentally or by worker that did not know other workers were in danger.
- A malfunctioning machine, that is dangerous to the operator, was not properly locked out while awaiting repair, and an uninformed worker begins operating the machine.
- Moving equipment that isn’t properly blocked or secured. Even if completely de-energized, you always have to consider movement by gravity.
- Inadequate safety procedures, or worker training.
It’s very important to insure all energy sources are disengaged before work begins. Some machines use a variety of energy types. Make sure they are all disabled. The different types of energy can include:

- mechanical
- electrical
- hydraulic
- pneumatic
- chemical
- thermal
- gravitational

WHEN DO YOU USE LOCKOUT/TAGOUT

Anytime any equipment or machine is serviced or under maintenance, lockout/tagout procedures must be followed. The definition of service and maintenance is very broad. It includes:

- constructing
- installing
- setting up
- adjusting
- inspecting
- modifying
- lubricating
- cleaning
- un-jamming
- changing or adjusting tools

Each piece of equipment has a specific sequence of steps for shutdown. The worker performing lockout/tagout must be familiar with the equipment and the proper shutdown procedure. If you are not familiar with the equipment you are shutting down, notify your supervisor. Note to supervisor: The OSHA regulation requires a written shutdown, lockout/tagout procedure for all machines and equipment, unless it falls under an exception. Machines that fall under the exceptions are listed on the back of the Lockout/Tagout Procedure Identification form. These written procedures should be covered at this point during this training.

GENERAL LOCKOUT PROCEDURE

Any procedure may be followed to lockout a machine, as long as adequate lockout is achieved and the safety of all workers is maintained. Following the steps below will insure your procedures are complete:

- Notify the Zone Maintenance Foreman, and/or the building administrator, and all affected workers of the intended shut down
- Shut down the equipment
- Disconnect all energy sources to the machine and discharge any stored energy
- Install lockouts and tagouts to insure the machine stays in the off or safe position. Tags must be properly filled out and workers must keep the lockout key.
- Test the machine to make sure it’s locked out
- When the service work is completed, check the machine to insure it’s properly assembled, and all tools have been removed
- Insure all workers are safely away from the machine
- Notify all affected workers that the lockouts are going to be removed
- Remove the lockouts and reenergize the power sources
- Notify all affected employees that the lockouts have been removed and that the machine is going to be restarted
• Start the machine

SPECIAL LOCKOUT SITUATIONS

There are certain situations that may require modifications to standard lockout procedures.

• Testing equipment in the middle of service: lockouts can be removed without going through the entire removal procedure, as long as they are reinstalled before work resumes.
• Outside personnel (contractors): must have and follow their own lockout/tagout program and it shouldn’t conflict with or endanger the facility’s employees. UM and contractors will share information on their lockout/tagout procedures.
• Group lockouts: a lead worker must monitor all individual worker lockout installations and removals, and general worker safety through out the service operation. Special lockout devices, such as a lock box, can be used to control individual lockouts.
• Shift and personnel changes: workers taking over a service operation in progress from other workers should install their lockouts before the workers leaving remove theirs. The machine must remain under continuous lockout during the change over.
• Removing someone else’s lockout: this should only be done when a supervisor personally confirms that the worker has left the facility, or is located in a safe area.
• Working on energized equipment and live pipe systems (such as energized electrical equipment and hot taps): only certified electricians are authorized to work on energized electrical equipment. Workers doing hot taps must have adequate training and experience to perform this work. Specific written procedures and safety precautions must be followed for these types of jobs.

WRAP-UP

Lockout/tagout is an essential procedure for any work place that uses powered equipment. It is a logical precaution to follow, and it gives workers the piece of mind that they are safe and that they personally control their own safety. Improper or inadequate lockout procedures will eventually result in severe accidents. Don’t take short cuts with your own safety. Lock it out.

SUGGESTED DISCUSSION QUESTIONS

1. What are some of the types of energy sources that need to be locked out?
2. What types of activities are considered to be service and maintenance?
3. What should be included in a written lockout/tagout procedure?
4. When does a machine not need a written lockout/tagout procedure?
5. Is there a required sequence that should be followed for all lockouts?
6. What are some situations where special lockout/tagout procedures are needed?
7. What is the major difference between a lockout and a tagout procedure?
8. Why would you use a tagout procedure instead of a lockout procedure?
LOCKOUT/TAGOUT CHECKLIST

General Lockout/Tagout Procedures
Use the following steps as a guideline for locking out any machine:

- Notify all affected workers of the intended shut down
- Shut down the equipment
- Disconnect all energy sources to the machine and discharge any stored energy
- Install lockouts to insure the machine stays in the off or safe position
- Test the machine to make sure it’s locked out
- When the service work is completed, check the machine to insure it’s properly assembled, and all tools have been removed
- Insure all workers are safely away from the machine
- Notify all affected workers that the lockouts are going to be removed
- Remove the lockouts and reenergize the power sources
- Notify all affected employees that the lockouts have been removed and that the machine is going to be restarted
- Restart the machine

Written Procedures Requirements
All machines needing a written lockout/tagout procedure must include the following items:

- the intended use of the procedure
- the steps for shutting the machine down and disabling it’s power sources
- the steps for installing the lockout/tagout devices
- the procedure to test the machine to insure it is properly locked out
- any special procedures to be followed when unlocking or restarting the machine

Written Procedures Exception
A machine is exempt from the written procedure requirement, if it meets all of the following:

- no stored energy after shut down
- only one energy source to be controlled
- installed lockouts completely de-energizes the machine
- only one lockout device is needed to fully lockout the machine
- the machine stays locked out during the entire service operation
- the lockout device is exclusively controlled by the worker(s) doing the service
- the service work does not endanger other workers in the area
- there have been no accidents with this machine when locked out under this exception