

Control of Hazardous Energy (LO/TO) (OHS-0005)

For



**Issued: April 2006
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DEFINITIONS

Affected Employee	Employee whose job requires them to work on or with the equipment being serviced or maintained.
Authorized	Employee trained and authorized in the use of placing a lockout/tagout device on a machine or piece of equipment requiring servicing or maintenance.
Double Valve Isolation	When two valves are closed at each energy source.
Energy Control Procedures	Procedures developed, documented, and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by the program.
Energy Isolation Device	A device or mechanism that 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.
Energy Source	Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
Equipment	Any device activated by an energy source(s). This could be a motor, pipeline, pump, tank, valve, etc. through which energy or material may pass.
HOA	Hand-Off Automation Switch.
Isolation	The creation of a barrier that prevents the flow of energy or material.
Lock	The lock is a device or mechanism that ensures the equipment cannot be turned on while the work is occurring.
Lockout	Lockout is the process of blocking the flow of energy from an energy source to a piece of equipment and keeping it blocked out. Lockout is accomplished by installing a lockout device at the energy source so that equipment powered by that source cannot be operated. A lockout device is a lock, block, or chain that keeps a valve or lever in the off position.
Lockout/Tagout Procedure Form	The document outlining the procedures identifying each isolation point and the method for isolating and locking out or tagging out each isolation point.
Other Employee	Employee whose work operations are or may be in an area where energy control procedures may be utilized. Other employees shall be instructed about the procedure and about the prohibition relating to an attempt to restart or re-energize machines or equipment which is located and/or tagged out.
PPE	Personal Protective Equipment (PPE) includes all clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons, work boots, and safety shoes.

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Qualified Employees	A qualified employee is a person who possesses a recognized degree, certification, or professional standing or who by expertise, knowledge, training, and experience has successfully demonstrated their ability to resolve problems relating to the work, subject matter, or the project.
Servicing and/or Maintenance	Any activity such as repairing, adjusting, lubricating or cleaning equipment where an employee may be exposed to the unexpected energization or startup of equipment or the unexpected release of hazardous energy.
Shall	Used in laws, regulations or directives to express what is <u>mandatory</u> .
Single Valve Isolation	When only one valve is closed at each energy source.
Stored Energy	Residual energy that could be potentially hazardous and released unexpectedly without warning.
Tagout	Tagout is the placement of a specially designed, weatherproof warning tag attached with a non-releasable, self-locking cable tie on the energy isolating device. The purpose of the tagout is to warn others that you are working on the equipment and it must not be started.

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1.0 PURPOSE

1.1 These practices and procedures are intended to provide for employee safety relative to energy hazards in the workplace.

2.0 DOCUMENT CONTROL

2.1 Approvals: This procedure as well as all Environmental, Health and Safety (EH&S) procedures must be approved by the Director, Environmental Health and Safety (DOHS).

Approved by: _____ Date: _____
Director, Environmental Health and Safety

2.2 Responsibility:

2.2.1 Department Manager

2.2.1.1 Within the department, annually audit authorized employees for compliance with the OSHA standard.

2.2.1.2 Provide guidance and assistance when needed.

2.2.2 Supervisor

2.2.2.1 Understands the University's Lockout/Tagout program and the correct means to lockout/tagout equipment in the department.

2.2.2.2 Ensures that the written procedures for multiple energy source equipment are being followed at all times.

2.2.2.3 Trains all new employees coming into the department in the University's Lockout/Tagout program and issues copy of current Control of Hazardous Energy Program.

2.2.2.4 Enforces the compliance with the program.

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2.2.3 Individual Performing Maintenance or Service on Equipment Requiring Lockout/Tagout

2.2.3.1 Be knowledgeable concerning the intent and use of this program and request additional training if the requirements of this program are not understood.

2.2.3.2 Be aware of the type of, magnitude of, the hazards of, and the correct means to control and isolate the chemical, electrical, hydraulic, gravity, spring, pneumatic thermal or battery energy associated with the equipment to be worked on.

2.2.3.3 Attach person's tag and/or lock as applicable.

2.2.3.4 Personally verify all energy sources have been locked/tagged out and that the equipment is at zero energy state.

2.2.3.5 Maintain the key to all personal locks in their possession.

2.2.3.6 At the completion of work, remove all locks and tags and notify affected employees that the equipment is safe to operate.

3.0 PROCEDURES

3.1 The following steps must be taken to perform a lockout/tagout procedure:

3.1.1 Notify all affected employees that a Lockout/Tagout procedure will be used and explain why.

3.1.2 Shut down the equipment using normal procedures. In the case of generated distribution electricity, the electrical power can be turned off.

3.1.3 Static electricity and energy stored in capacitors must be dissipated or discharged by appropriate grounding methods.

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4.0 PREPARATION FOR MAINTENANCE

4.1 Defective equipment or equipment requiring maintenance will be de-energized and locked and tagged out. Multiple Energy Source Equipment will be de-energized and locked and tagged out according to the applicable procedures of this program. The requirements will be reviewed with the personnel who will actually install the isolation devices and lockout and tagout devices.

4.2 Personnel required to make changes, repairs, or do maintenance of equipment must have knowledge of the type and magnitude of the energy hazards involved. They must know how to isolate the energy sources and install lockout/tagout devices. On multiple energy source equipment they must understand how to isolate and lock and tagout all energy sources. The authorized employee will then notify appropriate personnel in the area that the equipment has to be locked and tagged out for servicing.

4.3 Lockout and/or tagout devices must be attached to each isolation point. Locking at the isolation point and tagging it is always preferable to tagout only and must be done wherever possible.

Every isolation point must have a tagout device attached to it. The tagout devices must be filled out legibly. Tags will indicate the date it was hung and must be attached to the isolation point with a non-releasable, self-locking cable tie, or by passing the shank of the lock through the tag. Locks must be attached in such a manner that each lock functions independently, and the equipment cannot be energized until all locks and/or tags are removed.

4.4 Emergency isolation source will be locked if possible and must be tagged.

5.0 EQUIPMENT SHUT-DOWN

5.1 Shut down and isolation

5.1.1 Following the installation of lockout/tagout devices, the authorized employee shall insure that any potentially stored energy is relieved, such as in capacitors and batteries.

5.1.1.2 The authorized employee who will perform the maintenance or service at the work site will review the type and magnitude of energy involved and identify the location of all energy isolation points.

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5.1.1.3 Each authorized employee performing maintenance or service will place their personal lock and tag at each energy isolation location.

5.1.1.4 The authorized employee will then verify that the equipment is de-energized by:

5.1.1.4.1 Attempt to start the equipment by trying the start switch or other activating device(s).

5.1.1.4.2 Visually verifying that the equipment is de-energized and/or non-functional.

5.1.1.4.3 Depress the STOP switch after the visual inspection to ensure zero energy state.

5.1.1.5 All authorized employees will verify that they have installed their personal lock and/or tag, have reviewed the job, and have verified that the equipment is at zero energy state.

5.1.1.6 On multiple energy source equipment, Lockout/Tagout Procedure Form for Multiple Energy Source Equipment will be used to verify that all energy isolation points have been locked and/or tagged out. (Appendix).

5.1.1.7 Once the authorized employee's lockout is installed, the equipment may not be released for operation until the required repairs or maintenance has been completed. Once the equipment has been repaired, the authorized employee will then remove the locks/tags and advise affected employees in the area that the repairs have been completed and that the equipment is ready for operation.

6.0 TESTING AND POSITIONING

6.1 In the event that equipment testing or positioning is needed, the following actions shall be followed:

6.1.1 Clear the equipment of all tools and equipment.

6.1.2 Insure that all employees are free and clear of the equipment.

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6.1.3 Remove the lockout and tagout devices.

6.1.4 Energize and proceed with testing or positioning.

6.1.5 De-energize and follow the steps outlined for locking out the equipment.

6.1.6 Re-verify isolation and zero energy state.

7.0 EMERGENCY LOCK/TAG REMOVAL

7.1 Should an authorized employee who installed a personal Lockout/Tagout not be available to remove it, the Lockout/Tagout may be removed under the direction of the Supervisor provided that the Supervisor takes the following precautions:

7.1.1 Verifies that the authorized employee is not available,

7.1.2 Makes all reasonable attempts to contact the authorized employee to inform them that their lock and tag are being removed.

7.1.3 Completes a Lockout/Tagout Removal Form (Appendix) to document the above actions. Completed forms are to be kept in the Maintenance Department.

8.0 EXCLUSIONS TO LOCKOUT/TAGOUT

8.1 Normal production operations including repetitive, routine minor adjustments and maintenance which have safety guards in place at the adjustment location and the employee

8.2 Work on plug and cord-connected electrical equipment only when it is unplugged and there is complete control over the plug.

8.3 Hot tap operations with special hot tap equipment involving gas, steam, water or when the employer shows that continuity of service is essential, shutdown is impractical and documented procedures are followed to provide proven effective protection for employees.

8.4 A designated qualified employee standing guard at the energy isolation device for the sole purpose of ensuring the energy source is not activated.

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9.0 SPECIAL REQUIREMENTS

9.1 Electrical Equipment

9.1.1 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. Energized parts that operate at less than 50 volts to ground do not need to be de-energized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

9.1.2 Only qualified employees are permitted to work on energized circuits/equipment. They must be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools. When work involves electrical equipment that could permit exposure to 440 volts or greater, two (2) qualified employees must work together.

9.1.3 When de-energizing electrical devices, the authorized employee conducting the work will:

9.1.3.1 Place lockout/tagout devices on the disconnecting means used to de-energize the equipment and circuits,

9.1.3.2 Test the circuit or equipment to ensure it is de-energized and that no energized condition exists as a result of feedback.

9.1.3.3 Before re-energizing, the qualified employee will ensure that all lockout removal procedures have been followed and that equipment-guarding devices are installed prior to removal of lockout/tagout devices.

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9.2 High Voltage Equipment

9.2.1 In addition to the requirements, the following steps must be taken when isolating high voltage electrical equipment:

9.2.1.1 The high voltage electrician, or electrical engineer from the Office of the University Architect, shall write a step-by-step switching order.

EXCEPTION: The switching written order may be written by the high voltage foreman or documented by an assistant while performing the switching in the event of an emergency.

9.2.1.2 No one other than high voltage electricians will lockout/tagout or operate primary equipment, or remove lockout/tagout devices, up to and including secondary mains. *EXCEPTION: The high voltage foreman may remove lockout/tagout devices and restore power after a thorough inspection is made to assure that no one will be exposed to hazardous energy when power is restored.*

9.2.1.3 All high voltage switching shall be performed by at least two (2) high voltage electricians or one of the following:

9.2.1.3.1 One (1) high voltage electrician and their foreman

9.2.1.3.2 A high voltage electrician and a non-high voltage electrician under direct supervision of a high voltage foreman; or

9.2.1.3.3 In the case of a secondary main shutdown, one (1) high voltage electrician and one (1) non- high voltage electrician.

9.3 Compressed Gas or Air

9.3.1 Compressed gas pressure systems are 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.

9.3.2 Equipment using air or other compressed gas must be equipped with a main line shut off valve capable of being locked out or tagged out in the "off" position.

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9.3.3 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.

9.3.4 All compressed gas lines will be labeled. If labels do not exist, the employee shall notify their immediate supervisor and labeling will be applied.

9.4 Mobile Equipment Maintenance

9.4.1 Mobile equipment maintenance presents a variety of dangers from stored and potentially hazardous energy. It is important to bring equipment to a zero mechanical state in which there is no potential for accidental release of stored or potential energy and accidental start-up or movement is prevented. If working on wheeled equipment, wheel chocks shall be placed to prevent the equipment from rolling. If maintenance or service work requires that attachments or other components be elevated, hardwood blocks, equipment jacks, safety stops, or pivot-point pins shall be installed to prevent the elevated items from falling.

9.4.2 Shutdown/isolation of mobile equipment

9.4.2.1 Always follow the manufacturer's instructions. Some general rules for shutdown and isolation procedures are:

9.4.2.1.1 Park on a firm, level surface.

9.4.2.1.2 Place the controls in the park or neutral position.

9.4.2.1.3 Set the parking brake.

9.4.2.1.4 Lower forks, buckets, booms, or other attachments to the ground.

9.4.2.1.5 Idle the engine for gradual cooling when applicable.

9.4.2.1.6 Shut off the engine.

9.4.2.1.7 Cycle hydraulic controls to eliminate residual pressure.

9.4.2.1.8 Lock the ignition and remove the key.

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9.4.2.1.9 Lock all vehicle doors and place “DO NOT OPERATE—Servicing” Tags on outside door handles if working under vehicle on grade.

9.4.2.1.10 Attach a “DO NOT OPERATE” tag to the steering wheel or lever.

9.4.2.1.11 Block the wheels.

9.4.2.1.12 Disconnect the battery if working on or around the electrical system.

9.4.2.1.13 Install lift arm restraints or block the cylinders if work must be done with arms in the raised position.

9.5 Existing Piping Systems

9.5.1 Hazardous energy exists in piping systems in the form of steam, liquids, and chemicals. Program procedures for lockout/tagout should be followed when breaking into a line where there is potential for exposure to hazardous energy.

9.5.2 Many accidents occur because of the failure to verify that all energy sources have been isolated. In some instances, piping being serviced may be back-fed or be tapped into by several lines leading to an unexpected release. Process pipe drawings and/or plant maintenance personnel must be consulted to identify all lines feeding the system being serviced.

9.5.3 On steam systems above 15 psig, double valve protection is required when the work involved may jeopardize the integrity of the piping that the isolation valve is attached to. Clarification: When working on a main steam line between two isolation valves of verified reliability, it is not necessary to close a second main steam valve upstream of the repair area. When working on a small diameter steam line such as a trap station line, the small diameter valve is not adequate isolation. The steam main valve on each side of the repair area must be closed. This distinction is necessary because of the possibility of breaking a smaller diameter valve and compromising the safety isolation.

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9.5.3.1 If it is physically impossible to trace the line back to the lockout or to otherwise verify a safe line, a pinhole should be tapped prior to cutting a line.

9.5.3.2 By loosening bolts slowly all the way around a gasket, incomplete energy release of lines can be detected without injury.

9.5.3.3 Employees shall avoid working directly under a valve or cutting point where pipe contents may be released.

9.6 Gravity and Stored Energy

9.6.1 Regardless of the lockout/tagout procedure used, safety blocks or mechanical devices will be used to protect employees from any accidental equipment movement. Bleed off, or otherwise dissipate the residual pressure in steam, air, gas, water, electrical, mechanical, and/or hydraulic systems.

9.7 Contractors

9.7.1 Whenever outside contractors plan to engage in activities covered by the scope of this guideline, the Kent State University representative and the outside contractor will inform each other of their lockout or tagout procedures for the job. They will both ensure their personnel understand and comply with any restrictions and prohibitions of the energy control procedures to be used. Outside contractors must be informed of the Kent State University lockout/tagout procedure in full detail so that their employees understand the meaning of locks or tags that they may encounter during the course of their work. In addition, outside contractors using locks or tags shall inform the Kent State University representative to ensure that appropriate personnel are informed. Kent State University shall not retain removed contractor tags

9.8 Multiple Sources of Energy

9.8.1 Authorized workers face numerous issues that can complicate servicing operations, such as:

- Large and complex machinery, equipment, and systems
- Machinery, equipment, and systems that have multiple power sources, isolation points, and types of energy
- Difficulty identifying all energy sources due to incomplete engineering drawings and schematics

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9.8.2 In situations as stated above, Kent State University must utilize a hierarchy of responsibility among workers during servicing activities. Only authorized employees or primary authorized employees with the appropriate training on how to avoid the electrical hazards of working on or near exposed and potentially energized parts may perform the servicing of machinery, equipment or systems.

9.8.3 Affected employees, who only obtain minimal training in this area, are not permitted to perform such servicing. Coordination is a critical part of servicing machinery, equipment, and systems that have multiple sources of power. When the potential for the uncontrolled release of electrical energy exists during servicing operations, employers must coordinate between each of the following job functions within the hierarchy:

9.8.4 Lockout/Tagout Plus

9.8.4.1 Lockout/Tagout Plus Coordinator - A worker designated by the employer to coordinate and oversee all operations involving lockout and tags-plus applications on machinery or equipment with multiple power sources.

9.8.4.2 Primary Authorized Employee – A worker designated by the employer as having responsibility for each group of authorized employees performing servicing on the same machinery, equipment, or system during a group lockout/tags-plus application.

9.8.4.3 Authorized Employee - A worker who performs one or more of the following lockout/tags-plus responsibilities: executes the lockout/tags-plus procedures; installs a lock or tags-plus system on machinery, equipment, or systems; or services any machine, equipment, or system under lockout/tags-plus application (29 CFR 1915.80(b)(3)); and

9.8.4.4 Affected Employee - A worker who normally operates or uses the machinery, equipment, or system that is going to be serviced under lockout/tags-plus or who is working in the area where servicing is being performed under lockout/tags-plus (29 CFR 1915.80(b)(2)).

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9.8.5 A lockout/tags-plus coordinator or primary authorized employee are only required under certain circumstances. The lockout/tags- plus coordinator is required under two circumstances:

9.8.5.1 When workers are performing multiple servicing operations on the same machinery, equipment, or systems at the same time, or

9.8.5.2 When machinery, equipment, or systems with multiple power sources are being serviced at the same time.

9.8.6 During group servicing operations, a primary authorized employee is required and determines the safe exposure status of each authorized employee in the group with regard to the lockout/tags-plus system. The primary authorized employee also obtains approval from the lockout/tags-plus coordinator to apply and remove the lockout/tags-plus system and coordinates the servicing operation with the coordinator.

10 GROUP LOCKOUT PROCEDURES

10.1 Verification of Group Isolation

10.1.1 When more than one authorized employee is involved in equipment maintenance, a Group Lockout/Tagout procedure shall be used if individual lockout/tagout is deemed impractical. This procedure must provide the personnel involved with the degree of protection equivalent to the use of personal locks and tags.

10.1.2 Primary responsibility will be given to a lead authorized employee. The lead authorized employee must be on the job and be aware, at all times, of the location and status of all group members with regard to the lockout/tagout of the equipment. It will be the lead authorized employee's primary responsibility to be accountable for the safety of all group members under the lead authorized employee's control by providing the following written procedures:

10.1.3 The lead authorized employee will review the type and magnitude of the hazards and the correct means to control and isolate the chemical, electrical, hydraulic, gravity, pneumatic, spring, thermal or battery energy involved with the other authorized employees in the group. Each group member will attach their personal lock or tag to their assigned isolation device.

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10.1.4 Following installation of energy isolation and Lockout/Tagout, the lead person and all authorized employees shall verify that the equipment is de-energized and that the potentially stored energy is released

10.1.5 The group's lead person will then verify that all locks and tags are in place, all group members have reviewed the job, and the equipment has been verified to be at a zero energy state. (Multiple Energy Source Equipment)

10.2 Release from Lockout/Tagout

10.2.1 The lead authorized employee will verify their group members are free and clear of the equipment before it is released from lockout/tagout.

10.2.2 After all group members have been accounted for, each group member will remove their personal lock and/or tag.

10.2.3 The lead person may then retrieve the tag(s) from the lockout and proceed with release from isolation.

11 PROGRAM MONITORING

11.1 At least once a year an audit of the Control of Hazardous Energy Program shall be conducted to ensure that authorized employees are following the procedures and requirements.

11.2 The audit shall be performed by a department supervisor or manager who implements the Control of Hazardous Energy Program, not by an employee who is utilizing the energy control procedure that is being audited at the time.

11.3 If the audit finds any deficiencies, the person being inspected will be retrained or disciplined depending on the severity of the deficiency.

11.4 The individual conducting the audit shall use the Control of Hazardous Energy Program document to review and discuss requirements with the employee.

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11.5 The annual audit will be certified with the following information:

11.5.1 The equipment using the hazardous energy and the location on campus.

11.5.2 The date of the audit and the name of the employee being audited.

11.5.3 The name of the person performing the audit.

11.6 When lockouts *cannot* be used and a tagout is used, employees must be trained on the following restrictions on tags:

11.6.1 Tags affixed to isolation devices are warning devices that do not provide the physical restraint on the device that a lock would provide. Any tag attached to an isolation device must not be removed without authorization of the person attaching it, in accordance with the procedure, and must never be bypassed or ignored.

11.6.2 Tags must be legible and understandable.

11.6.3 Tags must be appropriately protected and attached with a non-reusable locking tie.

11.6.4 Tags can invoke a false sense of security and their meaning must be clearly understood.

12 EMPLOYEE TRAINING AND RETRAINING

12.1 Training and retraining will be provided to ensure employees understand the purpose and function of the Control of Hazardous Energy Program and that they have the knowledge and skills required for safe application, usage, and removal of isolation device(s). Training will be given and proficiency assured prior to authorization annually and upon a change in employee job assignment thereafter.

12.2 Each authorized employee who will use the Lockout/Tagout procedure will receive training in the recognition of type and magnitude of, the hazard of, and the correct means to control and isolate the energy source.

12.3 Each affected employee whose job requires them to operate or use equipment on which maintenance or servicing will be done, or works in an area where such maintenance or servicing will be done, will be trained in the purpose and use of the Control of Hazardous Energy Program.

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12.4 All other employees with jobs in or which may be in an area where hazardous energy control procedures may be utilized will be instructed regarding the procedure and about prohibition concerning restarting and re-energizing equipment which is locked out or tagged out.

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APPENDIX A
CONTROL OF HAZARDOUS ENERGY – INITIAL TRAINING

Location: _____

Instructor: _____ **Training Date:** _____

Control of Hazardous Energy OSHA Standard	<input type="checkbox"/>
Control of Hazardous Energy	<input type="checkbox"/>
When to Use Lockout/Tagout Definitions found in KSU's Procedure	<input type="checkbox"/>
How to Prepare for Shutdown	<input type="checkbox"/>
Knowledge Necessary for Installing Lockout/Tagout	<input type="checkbox"/>
Explain Lockout/Tagout Procedure Form	<input type="checkbox"/>
Notification of Affected Employees	<input type="checkbox"/>
Locking Out of Isolation Devices	<input type="checkbox"/>
How to Verify Isolation and Lockout/Tagout is Complete	<input type="checkbox"/>
Signatures Required	<input type="checkbox"/>
Release from Lockout/Tagout	<input type="checkbox"/>
Explain Testing and Repositioning	<input type="checkbox"/>
Group Lockout/Tagout	<input type="checkbox"/>
Explain Training and Annual Audit Procedure	<input type="checkbox"/>
Video (if available)	<input type="checkbox"/>

I have received the Control of Hazardous Energy Training listed above and agree to abide by the rules of our department's Control of Hazardous Energy Procedure.

Have all employees sign below and keep this copy in the Control of Hazardous Energy Program Manual. Use reverse side if needed.

PRINT NAME	SIGNATURE

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APPENDIX B
LOCKOUT/TAGOUT PROCEDURES TEST

1. The Lockout/Tagout Procedure is:(circle one)
 - a. OSHA compliant
 - b. Kent State University policy
 - c. All of the above
2. All employees are allowed to use locks and tags
 - a. True
 - b. False
3. The lockout/tagout procedure is to be used at all times when equipment maintenance is being performed.
 - a. True
 - b. False
4. Lockout tags can be hung with wire or string
 - a. True
 - b. False
5. When is training required? (circle one)
 - a. Once a quarter
 - b. Once a year
 - c. Once every two years
6. Before locking out a piece of equipment, the authorized employee must know: (circle one)
 - a. The type and magnitude of energy
 - b. The locations of each isolation device
 - c. The types of lockout devices needed
 - d. All of the above
7. Verification that the equipment is at zero energy state is to be done before maintenance work commences.
 - a. True
 - b. False

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**APPENDIX B
LOCKOUT/TAGOUT PROCEDURES TEST (CONTINUED FROM PREVIOUS PAGE)**

8. When releasing a piece of equipment back to production, the following should be verified:(circle one)
 - a. The equipment is operationally intact
 - b. All guards have been replaced
 - c. All locks and tags have been removed
 - d. All of the above

9. If it is impossible to use a lock to lockout a piece of equipment, then a lockout tag can be used.
 - a. True
 - b. False

10. I have completed the Control of Hazardous Energy (Lockout/Tagout) course, I acknowledge I may ask my supervisor questions regarding this subject and agree to follow the safe work practices as described in the training.
 - a. Yes
 - b. No

Employee Printed Name

Supervisor Printed Name

Employee Signature

Date

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**APPENDIX C
CONTRACTOR LOCKOUT/TAGOUT NOTIFICATION FORM**

Project Identification:
Description of Work:
KSU Project Representative:
KSU Department:
Contractor Representative:
Contractor Company Name:

The contractor and KSU representative have informed each other of their respective lockout/tagout procedures. A copy of the Lockout/Tagout Program has been made available to the contractor. The contractor and KSU representative agree to ensure that their personnel understand and comply with any restrictions and prohibitions of the energy control procedures that will be in place during this project.

Contractor Representative Signature	Contractor Representative Printed Name	Date
KSU Representative Signature	KSU Representative Printed Name	Date

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**Control of
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Energy**

Dates
Original: June 2015
Revised: 2015

APPENDIX E
HVAC, ZONES, ACPM, PLUMBERS, STEAMFITTERS, MOTOR EQUIPMENT MAINTENANCE and
ENERGY MANAGEMENT TECHNICIANS
LOCKOUT/TAGOUT DANGER TAG INFORMATION REQUIREMENTS

Before any work begins, the DANGER TAG will indicate:

- The name of who secured the energy or device.
- The name of the department and shop that secured the energy or device.
- The date when the energy or device was secured.
- The location of the device (i.e. building).
- What energy or device was secured.
- Testing/release method on the DANGER TAG (i.e., bled off to atmosphere, tested by meter, etc.).

(See examples below)

EXAMPLE 1

On an air handling unit that requires the v-belts to be changed. Place the hand-off auto switch to the hand position and verify that the fan or fans are running. Place the HOA switch in the off position and verify that the fan or fans stop. If the fan or fans stop, pull the electrical disconnect to the open position. Place the HOA switch back in the hand position and then verify that the fan or fans do not start. Lastly place the HOA switch back in the off position and follow the Lockout/Tagout procedures. Enter used HOA switch on the DANGER TAG.

EXAMPLE 2

A low pressure steam supply line needs a line trap replaced. Isolate the steam valve inlet to the trap. Isolate the trap discharge valve to the condensate return piping. Open the inlet strainer to the trap and vent steam to atmosphere. Enter vented to atmosphere on the DANGER TAG. When the work is completed, the DANGER TAG will indicate:

- That the energy or device was safe to return to operation ("safe to operate").
- Date it was returned to normal operation.
- Who returned the energy or device to operation.

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APPENDIX E (CONTINUED FROM PREVIOUS PAGE)
HVAC, ZONES, ACPM, PLUMBERS, STEAMFITTERS, MOTOR EQUIPMENT MAINTENANCE and
ENERGY MANAGEMENT TECHNICIANS
LOCKOUT/TAGOUT DANGER TAG INFORMATION REQUIREMENTS

 <div data-bbox="224 798 799 991" style="background-color: black; color: white; text-align: center; padding: 10px;"> DANGER </div> <div data-bbox="267 1197 750 1438" style="text-align: center;"> <p>THIS ENERGY SOURCE HAS BEEN LOCKED OUT</p> </div> <div data-bbox="276 1501 743 1711" style="text-align: center;"> <p>THIS TAG & LOCK TO BE REMOVED ONLY BY THE PERSON SHOWN ON BACK</p> </div>	 <div data-bbox="868 798 1443 991" style="background-color: black; color: white; text-align: center; padding: 10px;"> DANGER </div> <div data-bbox="917 1081 1388 1165"> <p>EQUIPMENT LOCKED OUT _____</p> </div> <div data-bbox="917 1197 1388 1281"> <p>EQUIPMENT LOCKED OUT _____</p> </div> <div data-bbox="917 1333 1388 1375"> <p>DATE _____ TIME _____</p> </div> <div data-bbox="917 1407 1388 1449"> <p>REMARKS _____</p> </div> <div data-bbox="917 1480 1388 1606"> <p>_____</p> <p>_____</p> <p>_____</p> </div> <div data-bbox="917 1638 1388 1680"> <p>EXPECTED COMPLETION _____</p> </div> <div data-bbox="917 1690 1388 1732"> <p>NAME _____</p> </div> <div data-bbox="917 1753 1388 1795"> <p>DEPT. _____</p> </div>
--	--

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**APPENDIX F
EMERGENCY LOCKOUT/TAGOUT REMOVAL FORM**

Date:	Time:
Equipment Locked:	
Location of Equipment:	
Reason for Removing Lock:	
Authorized Employee Name:	

Have the following actions been taken?

Yes	No	
		Verified that the equipment is safe before removing the lockout/tagout device?
		Removed all nonessential items from around the machine?
		Ensured all employees are free and clear of the equipment?

Answer items below only if removal of lockout/tagout done by an authorized employee other than installing employee.

Yes	No	
		Verified that the authorized employee is not available to remove their lockout device?
		Made all reasonable attempts to inform the authorized employee that the lockout has been removed?
		Contacted the authorized employee's Supervisor?

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**APPENDIX G
CONTROL OF HAZARDOUS ENERGY SOURCES
ANNUAL AUDIT (INSPECTIONS)**

Date of Inspection:	
I,	certify that
(Name of Person Conducting Audit/Inspection)	* (Name of Person audited/Inspected)
<p>was audited for compliance to the Control of Hazardous Energy Sources (Lockout/Tagout) Procedure on the date noted above. I have reviewed the Lockout/Tagout Procedure for Multiple Energy Source Equipment Form for the equipment indicated and the isolation <input type="checkbox"/>was / <input type="checkbox"/>was not (check one) performed correctly:</p>	

Additional Comments:

Signature of Auditor	Printed Name of Auditor	Date
Signature of Person Audited	Printed Name of Person Audited	Date

***A separate form must be submitted for each person being audited. Retraining will be required if isolation was not performed correctly.**

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**APPENDIX H
ACPM, MRW, & WATER TREATMENT SAFETY CHECK LIST**

DATE:	DESCRIPTION OF JOB:
TIME:	WORK LOCATION:
EMPLOYEE:	WORK ORDER OR LOG NUMBER:
DATE & TIME SUPERVISOR VISITED JOB SITE FOR SAFETY CHECK:	
POSSIBLE HAZARDS PRESENT:	

Harmful gases	Broken glass
Extreme hot water/steam	Live energy source
Excessive weight of equipment	Excessive noise level
Elevators stuck between floors	Use of flammable tools
Biohazards or exposure to infectious fluids	Hazardous position of equipment to be removed/replaced
High working places	Inadequate lighting
Use of chemicals	Insulation could contain asbestos.
Confined space	Unavoidable wet location
	Other:

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**APPENDIX H (CONTINUED FROM PREVIOUS PAGE)
ACPM, MRW, & WATER TREATMENT SAFETY CHECK LIST**

PROCEDURES & PPE REQUIRED TO SAFELY PERFORM JOB

Lockout/Tagout Equipment	Eye/Face Protection
Hot Work Permit	Hearing Protection
Asbestos Abatement	Biohazard Cleanup Kit
Elevator Procedures	Rubber/butyl/latex Gloves
Confined Space Permit	Long Sleeve Shirt
Safety Harness and Tripod	Hard Hat/ Bump Cap
Forced Ventilation Equipment	Two person teams with two way radios
Respirator	Caution Tape/Barriers
Air Space Monitor	Protective Boots
	Fire Extinguisher
Other: _____	

Employee Signature: _____

Employee Printed Name: _____

Date: _____

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**Control of
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**APPENDIX I
HVAC & ENERGY MANAGEMENT TECHNICIANS
SAFETY PROCEDURE CHECK LIST**

Date:		Time:	
Employee:			
Description of Job:			
Work Location:			
Work Order or Log Number:			
Date and time of supervisor's safety check:			
YES	NO	ITEM TO CONSIDER	PROCEDURES & PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS
		I have reviewed this job assignment with my supervisor and have been made aware of possible safety issues and proper procedures to follow.	Lockout/Tag Out Ground fault protection 500V insulated gloves Leather protector gloves Safety harness and tripod Forced air machine Respirator Eye or face protection Long sleeved shirt Ear protection Caution tape or barriers Bump cap Air space monitor Lifting platform or crane Asbestos abatement required Confined space permit Hot work permit Fire extinguisher Other
		Do I know and understand the proper procedures to do the job?	
		Do I have the right PPE and tools for the job I've been assigned?	
		Have I informed the affected personnel that I will be de-energizing the panel, circuit, and/or equipment and have I relayed the approximate time of the outage?	
		Is my work environment well lit?	
		Is my work area free of water, tripping hazards or any other hazards? I.e. Was dry ice ever used in this space?	
		If I have identified any safety hazards, have I contacted my supervisor and/or other responsible parties in order to remedy the situation?	
		If using extension cords or power tools, are the cords free from damage (ground pin removed, cracked, cut, or taped)?	

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APPENDIX I
HVAC & ENERGY MANAGEMENT TECHNICIANS – SAFETY PROCEDURE CHECK LIST
(CONTINUED FROM PREVIOUS PAGE)

YES	NO	
		Do I feel that I can do the job safely? Have I communicated this with my supervisor?
		Will I be alert and not rush the job by reaching blindly into areas containing live parts?
		Is the operating voltage 480 volts or below? (480 volt is the maximum circuit you are allowed to work on.)
		Are there internal safety mechanisms? I.e., anything other than the obvious devices likes H.O.A. or disconnects that could start or stop this equipment?
		After turning disconnecting means to the "OFF" position, have I checked to see if the conductors are de-energized using the appropriate tester? There may be more than one energy source in the device.
		During troubleshooting, if testing equipment in an energized state, have I used the proper PPE equipment and tools for the job?

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**APPENDIX J
STEAMFITTER, PLUMBER AND WELDER SAFETY CHECK LIST**

Date:	Time:
Employee:	
Description of Job:	
Work Location:	
Work Order or Log Number:	
Date and time of supervisor's safety check:	

POSSIBLE HAZARDS PRESENT

Harmful gases	Buried utilities
Extreme hot water/steam	Live energy source
Excessive weight of equipment	Excessive noise level
Trench cave in possible	Use of flammable tools
Low head and side clearances with limited egress	Hazardous position of equipment to be removed/replaced
High pressure environment	Inadequate lighting
Confined space or high elevations	Unavoidable wet location
Insulation that may need to be removed in order to complete work (asbestos containing)	Other
Chemicals (including fluids containing chemical treatment)	

PROCEDURES & PPE REQUIRED TO SAFELY PERFORM JOB

Lockout/Tagout equipment	Eye or face protection
Hot work permit	Ear protection
Asbestos abatement required	Welding coat & helmet
Call Ohio Utilities Protection Service (OUPS)	Heavy leather gloves
Confined space permit	Long sleeve shirt
Safety harness and tri-pod	Hard hat / Bump cap
Forced air machine	Shoring box
Respirator	Caution tape or barriers
Air space monitor	Boots
Ground fault protection	Fire extinguisher
Two man teams with two way radios	Other
SDS sheets interpreted and understood for actions in case of exposure.	

Employee Signature	Employee Printed Name	Date
---------------------------	------------------------------	-------------

Supervisor's Signature	Supervisor's Printed Name	Date
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**APPENDIX K
ELECTRICIANS SAFETY CHECKLIST**

THIS DOCUMENT MUST BE COMPLETED ON EACH PROJECT AS REQUIRED BY UNIVERSITY FACILITIES MANAGEMENT

DATE:		TIME:	
EMPLOYEE:			
DESCRIPTION OF JOB:			
WORK LOCATION:			
WORK ORDER OR LOG NUMBER:			
DATE AND TIME SUPERVISOR VISITED SITE FOR SAFETY CHECKS:			
YES	NO	ITEM TO CONSIDER	PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS
		I have reviewed this job assignment with my supervisor and have been made aware of possible safety issues and proper procedures to follow.	Lockout/Tag Out
		Do I know and understand the proper procedures to do the job?	Ground fault protection
		Do I have the right PPE and tools for the job I've been assigned?	500 V insulated gloves
		Have I informed the affected personnel that I will be de-energizing the panel, circuit, and/or equipment and have I relayed the approximate time of the outage?	5 KV gloves
		Is my work environment well lit?	15 KV gloves
		Is my work area free of water, tripping hazards or any other hazards?	Protective sleeves
		If I have identified any safety hazards, have I contacted my supervisor and/or other responsible parties in order to remedy the situation?	Electrical hard hat
		If using extension cords or power tools, are the cords free from damage (cracked, cut, or taped)?	Insulator boots
		Do I feel that I can do the job safely? Have I communicated this	Insulator mat Insulator blanket
		Will I be alert and not rush the job by reaching blindly into areas	1000V rated tools
		What is the operating voltage?	Insulator coat
		Are there internal safety mechanisms?	Safety harness and tripod
		After turning disconnecting means to the "OFF" position, have I checked to see if the conductors are de-energized using the appropriate tester?	Force air machine
		During trouble-shooting, if testing equipment in an energized state, have I used the proper PPE equipment and tools for the job?	Respirator
			Eye or face protection
			Long sleeved shirt
			Ear protection
			Caution tape or barriers
			Hot stick
			Other _____

Print Name: _____ Print Name: _____
 (Employee) (Supervisor)
 Employee Signature _____ Supervisor Signature: _____

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**APPENDIX L
EMPLOYEE ACKNOWLEDGEMENT OF
CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT) PROGRAM**

I, THE UNDERSIGNED, HAVE BEEN GIVEN THE KENT STATE UNIVERSITY
DOCUMENT "CONTROL OF HAZARDOUS ENERGY PROGRAM
(LOCKOUT/TAGOUT)".

I ACKNOWLEDGE I MAY ASK MY SUPERVISOR QUESTIONS REGARDING THIS
SUBJECT AND AGREE TO FOLLOW THE SAFE WORK PRACTICES AS DESCRIBED
IN THIS DOCUMENT.

Employee's Printed Name

Employee's Signature

Date