Title: Hazardous Energies Control and Lockout/Tagout Program	**Document No.:** OCS-201 **Revision No.:** 02 **Date: February 2, 2017** **Approved By**: Avraham Boruchowitz, CSP, CHMM

1.0 Program Description

The Radford University Hazardous Energies Control and Lockout/Tagout Program, as maintained by Environmental Health and Safety (EHS), applies to all employees who service or maintain machinery, equipment, or related electrical systems where there is potential for exposure to hazardous energy sources. This program has been developed to ensure that employees' health is protected from hazardous energies in the work environment.

2.0 Scope

This program applies to the installation, service, maintenance, or removal of any type of machinery, equipment, or components in which the unexpected start-up or release of stored energy could cause injury or death. ***The requirements of this program apply to work activities involving hazardous energy sources conducted by university personnel without regard to work location.*** These energy sources include electrical, mechanical, hydraulic, chemical, and thermal. Employees are expected to use work practices, such as proper de-energization and the application of appropriate lockout devices and tags, to prevent the unexpected start-up or release of stored energy. *Note: Stored energy may be in the form of electricity (capacitors), air pressure (pneumatic), liquid pressure (hydraulic), springs, or potential energy of position, but it is not limited to these.*

This program requires a systematic approach to servicing and maintaining equipment and machinery. The program strives to ensure the safety of all personnel and contractors as well as compliance with all applicable regulations. This approach involves: following approved and written equipment-specific procedures to shut down and lock out equipment and machinery, dissipating all hazardous energy, blocking parts where necessary, and verifying that the energy has been controlled before all work is initiated.

Persons who fail to follow established written procedures for lockout of equipment and machinery, or who fail to take appropriate steps to protect the safety of all persons who are performing work under locked out conditions may be subject to disciplinary actions. This includes employees performing lockout that are not previously trained and authorized. Persons applying locks and/or tags must attend EHS Authorized Lockout/Tagout Employee Training. Awareness level training is available for personnel in the general area where Lockout/Tagout is conducted to provide a basic understanding of the program requirements. *Departments must supply appropriate devices for lockout/tagout and ensure that personnel are trained and authorized.*

No employee shall install, service, remove, or perform electrical or mechanical maintenance on any electrical equipment or machinery until that equipment is turned off or de-energized, all

stored hazardous energy has been bled down, dissipated, or blocked off, and the machinery has been locked out and blocked as described in this program.

Lockout is required for mechanical service and maintenance operations if the procedures to be performed could involve employee exposure to energized electrical parts, to machinery that could unexpectedly start up, or to a stored energy source on the equipment or machinery.

Servicing or maintenance on equipment that is powered through an electrical cord and plug shall be worked on with the cord unplugged. The person performing the work must have exclusive control of the plug at all times. If necessary, this can be accomplished by applying some form of plug lock or cord cap lock-over device that is secured with the worker's personal lock and tag.

Work on energized hazardous energy sources, such as electrical (at 50 volts or greater), hydraulic, pneumatic, steam, etc. is not permitted at Radford University without prior written approval by the supervisor, EHS, and the Director of Facilities Management. The approval of all three is required for the work on energized hazardous energy sources to continue. Information regarding energized electrical work approval is covered in the Electrical Safety Program.

3.0 Definitions

Affected and Other Employee – Any employee in an office or industrial setting who works around outlets, electrical panels, or electrical switches, and whose job requires them to be near or around the hazard zone (but not within the hazard zone) when equipment is being serviced or maintained under a locked-out or tagged-out condition. For example, a machine operator that must stay near the machine during a lock out is classified as an Affected Employee. Office staff working on computers and electrical equipment when nearby equipment is being serviced or maintained during a lockout are also classified as Affected Employees. The Affected Employee must be instructed never to attempt to restart or reactivate equipment that is locked out or tagged out.

Assigned Individual Lock – A padlock or combination lock issued to an employee for which no other person has the key, combination, or means of opening without using destructive force. The lock shall be uniquely identified and shall not be used for any other purpose.

Authorized Lockout/Tagout Employee – A person who has completed the required hazardous energy control training and is authorized to lockout or tagout a specific machine or equipment to perform service or maintenance. A person must be certified as an Authorized Lockout/Tagout Employee in order to apply a lock or tag to control hazardous energy and must be trained in equipment specific procedures for their individual work units.

Title: Hazardous Energies Control and Lockout/Tagout Program	Document No.: OCS-201 Revision No.: 02 Date: February 2, 2017 Approved By: Avraham Boruchowitz, CSP, CHMM

Blocked – A condition where a mechanical device is inserted into the energy path to physically prevent movement. It is most commonly used with mechanical machinery or fluid filled lines.

"Capable of Being Locked Out" – An energy isolation device will be considered capable of being locked out if it is designed with a hasp or other means of attachment to which a lock can be affixed, or if it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability.

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

Energy Isolating Device – A mechanical device located at an energy control point that positively blocks the flow of energy and can be locked in the "safe" position. Push buttons, selector switches, software controls, interlocks, and other control circuit devices are not considered energy isolating devices.

Energy Source – Any source of energy that could cause injury. This includes energies such as electrical, mechanical, hydraulic, pneumatic, and gravity where the energy source(s) could cause injury through the motion or operation of machinery or equipment. This also includes energies where injury may be caused by the direct transfer of energy to the person such as electrical, pressure energies (e.g. hydraulic or pneumatic above 12 psi), chemical or thermal.

Hazardous Energy – Energy, if not controlled, of such a magnitude that it is capable of causing injury, death, or a loss of resources.

Hazardous Energy Control – The process of systematically implementing mechanical means to prevent hazardous energy from flowing to a person. This includes using mechanical means to achieve the following conditions:

- Isolated – A condition where all sources of hazardous energy have been controlled by breaking the energy path so that the energy cannot flow to workers. The term "isolated" is commonly used with electrical circuits and fluid lines.
- Dissipated – A condition where all stored energy has been reduced to a non-hazardous level. The term is most commonly used with energy storing devices such as capacitors, pressure receivers, or springs.

Hazard Zone – The space around a source of hazardous energy where a person could be harmed if the hazardous energy was suddenly or unexpectedly released; such as the unexpected release of stored pressure, the unexpected movement of a machine, or the spray from a hazardous chemical that was unexpectedly released.

High Voltage System – Associated electrical conductors and equipment operating at or intended to operate at a sustained voltage of more than 600 volts.

Lockout – The method of applying a mechanical lockout device and a tag on an energy-isolating device by an authorized employee in accordance with established written procedures, in order to control hazardous energies.

Lockout Device – Padlocks, combination locks, or other methods (such as disconnecting conductors or removing fuses), which will effectively prevent unexpected or inadvertent energizing of a designated circuit or release of equipment or machinery. These devices shall not be used for other purposes, and shall include a means to indicate the identity of the employee applying the device.

Low Voltage System – Associated electrical conductors and equipment operating at or intended to operate at a nominal voltage less than or equal to 50 volts.

Normal Production, Normal Production Operation – Using a machine or piece of equipment for its intended or designed production function. If a machine or piece of equipment is not actively producing its product, it is not considered to be in production.

Servicing and/or Maintenance – Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, troubleshooting, and maintaining and/or servicing of machinery or equipment. These activities include lubrication, cleaning or unjamming 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.

Stored Energy Source – Any device that is capable of holding energy after equipment shutdown. This includes, but is not limited to, capacitors, tanks, pipes, springs, and flywheels.

Tagout – The placement of a tagout device on an energy-isolating device in accordance with established written procedures to control hazardous energy. Using tagout as a form of hazardous energy control is not a positive means of controlling hazardous energy and shall not be used whenever lockout is possible.

Tagout Device – A prominent warning tag capable of being securely attached that provides a warning not to use the equipment. The tag should include: reason for tag, name of person placing the tag and how that person may be contacted, and the date the tag was placed. Tags must be durable and able to withstand the environment to which they are exposed for the maximum time exposure is expected. Tags must include a legend such as: Do Not Start; Do Not Operate; Do Not

Close; Do Not Energize; or Do Not Open. Tags must be legible and understandable. These tags shall not be used for other purposes.

4.0 Responsibilities

Supervisor Responsibilities (Facilities Management/Departments Performing Lockout/Tagout)

- Supervisors are responsible for ensuring that all Affected Employees (including new and transferred employees) are trained in the safety significance, purpose, and use of these lockout/tagout procedures.
- Supervisors are responsible for ensuring all Authorized Lockout/Tagout Employees receive the appropriate level of training and that these employees are provided with the proper equipment and personal protective equipment (PPE) to perform the job safely.
- Supervisors are responsible for ensuring that only qualified high voltage electrical workers work on high voltage systems (>600 volts), and only Authorized Lockout/Tagout Employees work on systems that contain hazardous voltages equal to or below 600 volts.
- Supervisors are responsible for ensuring equipment specific lockout/tagout procedures are in place before Authorized Lockout/Tagout Employees perform lockout/tagout operations.

Authorized Lockout/Tagout Employees

- Employees are responsible for attending EHS Lockout/Tagout Authorized Person training and to use work practices developed in accordance with this program to prevent injuries that could result from the unexpected start-up of equipment or the release of stored energy.
- Employees must attend refresher training every three years, or due to incident, observation of unsafe work practices, update of requirements, or changes to operating guidelines.
- Employee must adhere to the written equipment specific lockout/tagout procedures for the equipment or machine being serviced or maintained. If no written procedure exists the employee shall notify their supervisor and EHS. Work should not be performed until a reviewed written procedure is in place.

Environmental Health and Safety (EHS)

EHS is responsible for developing, implementing, and administering the Hazardous Energies Control and Lockout/Tagout Program. These responsibilities include:

- Assisting Facilities Management and other departments on campus who perform electrical work to interpret the standards and regulations as they apply to the work being performed.
- Assisting Facilities Management and other departments in writing equipment specific lockout/tagout procedures.
- Training all Authorized Employees in the associated hazards, general safe work practices, and program requirements.
- Maintaining centralized records of training, inspection data, and reports.
- Conducting an annual review of each department that conducts work within the scope of this program.

5.0 Program Components

Flow Chart (Appendix A)

5.1 - Sequence of Hazardous Energies Control Procedure (Appendix B)

5.1.1 The Authorized Lockout/Tagout Employees performing the work, as well as their supervisor, must create the work plan, written lockout procedures, and physically locate and identify all isolating devices to be sure which switches, valves, or other energy isolating devices apply to the equipment to be locked out.

5.2.1 Employees authorized to lockout/tagout equipment must be certain which switch or other energy isolating devices apply to the equipment to be locked out.

- All energy isolating devices must have labels identifying the equipment supplied and the type and magnitude of energy isolated.
- CAUTION: Any questionable identification of electrical energy sources must be cleared by the employees with their supervisor before proceeding.

5.3.1 Notify all Affected and Other Employees as necessary that a lockout is to be performed. These persons must be informed that they are not to disturb the lockout device or attempt to re-start the equipment until they are informed that the lockout has been cleared and it is safe to resume normal operations.

5.4.1 If the equipment is in operation, shut it down using the normal shutdown procedure. Turn the equipment off if there is an off/on switch.

5.5.1 Open the circuit breaker, disconnect switch or other energy-isolating device (i.e. turn it to the "OFF" position). Toggle switches, push buttons, and other types of control switches are not energy isolating devices.

5.6.1 All energy-isolating devices must be locked out. Lockout the circuit breaker, disconnect the switch, or other isolating device, in the open ("OFF") position with an assigned individual lock, and attach an identifying tag to the lock. If it is impossible to use a lock, refer to section 5.6, "Procedure When Physical Locking Is Impossible."

5.7.1 For electrical equipment which has capacitors that must be manually discharged to assure safe work, open access panels and discharge these capacitors with an appropriate discharge tool and follow directions in the equipment manual or maintenance procedures. This must only be accomplished by an Authorized Lockout/Tagout Employee authorized to perform such work.

5.8.1 All forms of stored energy must then be dissipated (except for batteries which can be disconnected). This may include relaxing any springs, relieving any pressure or vacuum, allowing flywheels to come to rest, or neutralizing or adequately removing any chemicals.

5.9.1 Any parts that could inadvertently move during the procedure must be blocked in place to prevent this movement. Blocking must be secured in place so that it cannot be inadvertently removed or fall out.

5.10.1 At this point it must be verified that all forms of hazardous energy have been reduced to zero potential. If the work to be performed involves de-energized electrical equipment, this equipment must be tested with some form of test equipment to verify that there is no electrical energy present. Other forms of energy also require verification of zero potential. Examples of such means of verification include: observing a pressure gauge for zero pressure (gauge) or vacuum, observing a multi-meter showing zero volts, observing a spring in a relaxed state, observing that a flywheel is not spinning, or using litmus paper or a measuring device to verify that a chemical is no longer present or hazardous.

- The final step is to attempt to re-start or re-energize the equipment or machinery to verify an isolated condition. If the equipment does not re-start, then work can proceed. If the equipment re-starts or it appears that energy has been allowed to flow into the system, there could be a serious flaw in the procedure, and no work should proceed until the problem is identified and appropriate steps are included in the procedure to control this energy.
- The equipment is now locked out. Work may now begin.

5.2 – Situations Involving More Than One Person Locking Out

Employees and/or contractors must engage in a group lockout situation. If more than one employee works on the equipment, a lockout adaptor suitable for the installation of several locks must be used, enabling all workers to lock out the machine with their individual locks.

5.3 – Procedure Involving Personnel Changes During the Job

Persons being replaced or exchanged on a job during a shift or at the end of a shift must ensure that the lock(s) and tag(s) of his/her replacement are substituted for his/her own before leaving the job.

If a lockout procedure is to continue through the following work shift, the oncoming work crews must place their locks and tags on the energy isolation devices before the departing crew removes their locks and tags. Before work begins on the subsequent work shift, the oncoming crew must re-verify that all safety devices, such as blocking, are in place, that there is still zero energy in the system, and they should attempt to re-start or re-energize the system before anyone enters the hazard zone.

5.4 – Procedure When Work Is left Unfinished

Locks, tags, and all other safety warning devices must be left in place during all short absences such as breaks or trips to pick up parts.

When work is incomplete and temporarily suspended overnight or over a weekend, all locks, tags, and other safety warning devices must be left in place.

When work is suspended for more than a weekend, the equipment or machinery must be tagged as out of service, permanently disconnected from all energy sources, and must have its cover and access panels reinstalled. All locks and other tags must be removed.

5.5 – Procedure When One Employee Leaves the Area without Removing Their Lock

When an employee leaves the facility site and does not remove his/her lock(s) from the energy isolating device(s) (for example, if the employee became sick and left the site) then the responsible supervisor must attempt to contact that employee to determine if he/she will be able to return to remove the lock. If it is verified that the equipment is ready to be returned to service, and the employee is unavailable or cannot return, the supervisor must complete the Abandoned Lock Removal Authorization Form (Appendix C), then cut the lock(s) off the energy isolating device(s).

Once the employee returns to the work site, that person must be informed that their lock was removed and the status of the equipment that was locked out (e.g. returned to service, still under lockout, etc.).

5.6 – Procedure When Physical Locking Is Impossible

When it is impossible to use a lock, a tagout device must be used in used in lieu of a lockout along with another positive means of disconnecting the circuit, equipment, or machinery. This can include unplugging the equipment (or locking out the plug), disconnecting the conductors, or removing fuses.

All other steps of the process are the same as those listed previously for lockout. A tagout device must be placed on the plug, conductors, disconnected switch, fuse brackets, or other positive means employed.

5.7 – Procedure When Machine Testing Is Required During a Lockout

On some machines, it may be necessary to energize or start up machinery or equipment during a lockout procedure to tune, adjust, or make measurements before the machine is fully restored to service. In those instances, all persons must clear the hazard zone of all tools and equipment, leave the hazard zone, verify that all persons are clear of any hazards, remove the necessary locks, and then the equipment can be energized. A qualified person must then make the necessary measurements or adjustments and the equipment shut down. The locked-out condition must then be reestablished by repeating the exact same work step specified on the written procedure for fully locking out the equipment.

5.8 – Lockout Requirements for Specific Situations

Work on pressure or vacuum systems:

- For pneumatic systems (e.g., generally where compressed air is used to perform some mechanical function).
- Pneumatic systems are generally used to provide some force for mechanical movement. For isolating such a system, it may be more logical or convenient to isolate (block) and lockout the mechanical portion of the energy path. If servicing or maintaining is to be performed on the pneumatic system itself, the compressor pump must be turned off and locked out and the air receiver or system depressurized before work can begin.

Work on Electrical Power Systems or Equipment:

Work on de-energized electrical equipment or systems must be accomplished by person(s) who are Authorized Lockout/Tagout Employees. Electrical energy must be locked out at a disconnect

switch that positively interrupts the circuit supplying the electricity or the equipment is physically disconnected from the source of electricity. Interlocks, software controls, relays, or other control circuit devices are prohibited for use to control hazardous electrical energy for servicing or maintenance. The equipment or circuits must be verified to be de-energized with a test meter or other type of testing device before work is to begin.

Restoring Equipment to Service:

The restoration procedure is specified in the written lockout procedure below, and must be performed in the exact sequence as stated:

1. Remove all blocking and replace any critical parts removed during the lockout procedure.
2. Ensure that all tools or equipment have been removed from the hazard zone.
3. Close and secure all cover panels and doors. If all panels or doors cannot be closed, which may occur when testing, place barricades or rope-off a safety zone with non-conductive material and post prominent warning signs around the area.
4. Advise all Affected and Other Employees that the system is to be reenergized.
5. Ensure all persons are clear of the equipment/hazard zone.
6. Remove locks and tags. NOTE: Ordinarily, only the person who placed the locks and tags may remove them. If the person who placed the locks and tags is not available, only his/her supervisor may cut off the locks and tags, after personally ascertaining it is safe to do so.
7. Energize the equipment and restore the equipment to normal condition.
8. Notify all Affected and Other Employees that the lockout condition has been cleared.

This program does not cover the following:

- Certain tasks, such as minor tool changes and adjustments that are part of the normal production operations and can be accomplished without removing protective guards or with the use of tools where the employee is not potentially exposed to hazardous energy or inadvertent startup of the equipment.
- Work on electrical equipment or systems where the work must be done on exposed, energized electrical parts or where there may be a potential for electric shock or electric burns. This type of work is to be done only after responsible supervision has determined that the work must be performed with the equipment energized. Only Qualified Employees will be allowed to perform energized electrical work while wearing appropriate protective equipment using approved work techniques.

5.9 – Enforcement

Supervisors and managers of Authorized Lockout/Tagout Employees shall periodically audit their employees on the job to ensure compliance with lockout procedures.

Employees who fail to adhere to lockout and tagout procedures may be subject to disciplinary action.

Each hazardous energy control procedure must be inspected at least annually to verify its effectiveness. Supervisors, or their appointed designee, together with EHS, must perform this review. The completed review form will be retained as certification that the required review has been accomplished.

The reviewer(s) must review each Authorized Lockout/Tagout Employee participating in the lockout procedure including their responsibilities under the written hazardous energy control procedure. The inspection shall be certified in accordance with the Hazardous Energy Control Procedure Review Checklist (Appendix D).

Any observed deviations from the written lockout procedure or inadequacies in the employees' required knowledge or understanding of their responsibility under the procedure will be noted on the audit form. Refresher training must be conducted to correct these deficiencies.

No employee shall install, service, remove, or perform electrical or mechanical maintenance on any electrical equipment or machinery unless he/she is trained, and "Authorized" for the specific tasks to be performed, which shall include the specific lockout procedures necessary for that task.

6.0 Hazardous Energy Control Procedures

Where procedures are required, the department must maintain them in written form. These procedures must be available for Authorized Lockout/Tagout Employees to use when work covered by the Hazardous Energy Control Procedure is to be performed. The procedures must be retained by the department until superseded by annual review or updated. Authorized Lockout/Tagout Employees who have been trained on a specific procedure may be included on the procedure as a person authorized to perform work under that procedure. If this is not done, the department must document which employees have been trained on the procedure in some other manner.

If possible, it is recommended that the procedure be posted at the location of fixed machinery and equipment.

EHS will maintain and make available a blank Hazardous Energy Control Procedure Form (Appendix B) for use as the template for specific equipment or machinery.

7.0 Reporting Requirements

There is no requirement to report any information to any agency.

8.0 Training Requirements

Employees who are working in areas where lockout/tagout is being conducted should attend awareness level training so that they understand the program requirements and procedures, and that the devices are not to be tampered with, removed, or bypassed in any way. Awareness level refresher training should be conducted every five years.

Each employee who will conduct work covered by this program must attend Lockout Authorized Employee training offered by EHS prior to beginning such work. Additionally, each Authorized Employee must receive specific training on each Hazardous Energy Control Procedure to be used. This training is to be conducted by a departmental Authorized Lockout/Tagout Employee familiar and experienced with the procedure and system, machinery, or equipment. Refresher training is due every three years. Due to incident, observation of unsafe work practice(s), update of this program, or changes to operating guidelines, EHS may require refresher training for Authorized Lockout/Tagout Employees prior to the established refresher period of three years.

9.0 Appendices

- **A – Hazardous Energy Control Program Flow Chart**
- **B – Hazardous Energy Control Procedure Form**
- **C – Abandoned Lock Removal Authorization Form**
- **D – Hazardous Energy Control Procedure Review Checklist**

10.0 Document Revision History

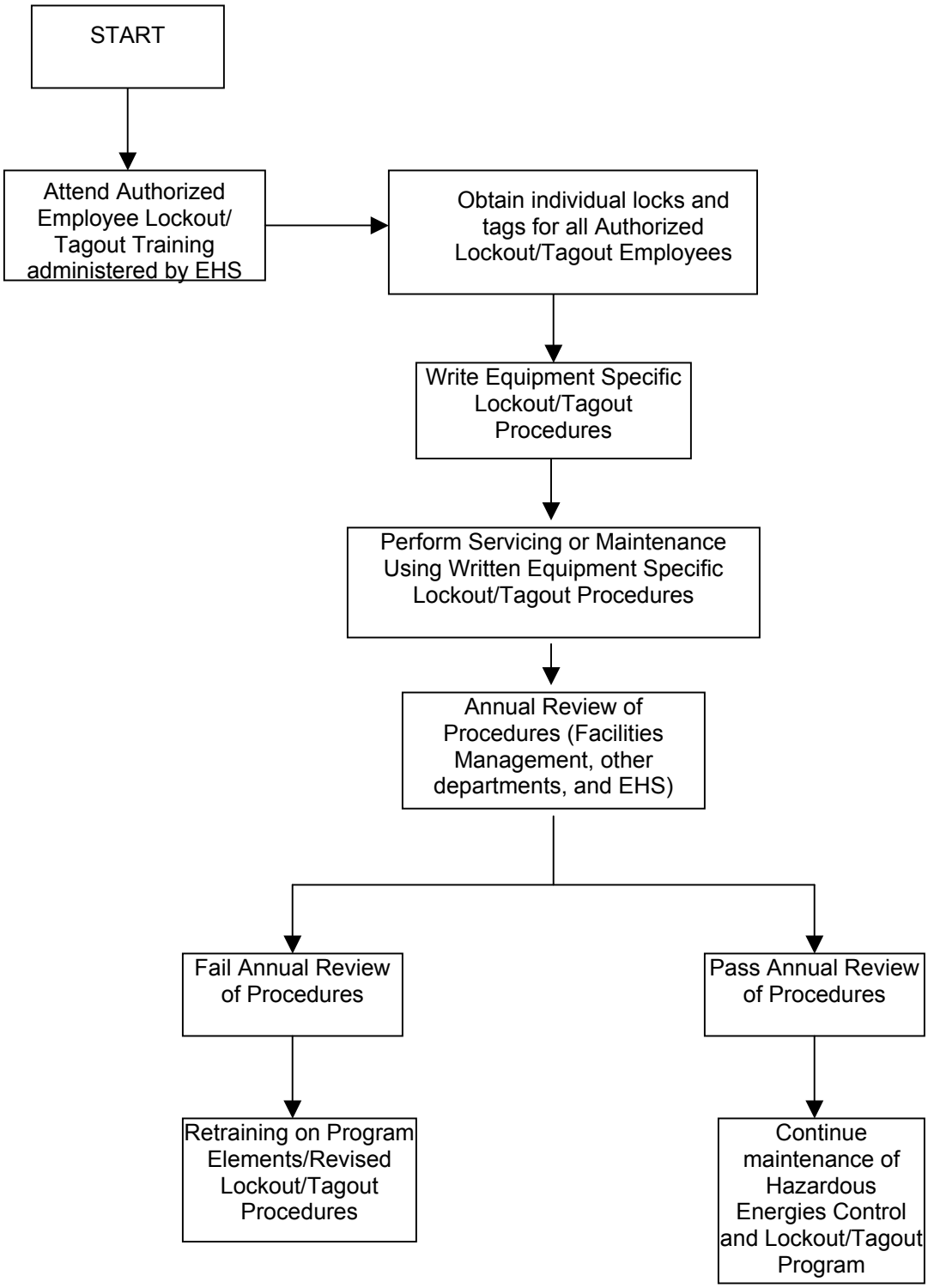
Revision	Section(s) Changed	Change(s) Made:	Date
00	All	Initial Draft	Unknown
01	All	Draft overhaul, extensive rewrite	1/26/16
01	3.0	50 Volts & Electrical Safety Program tie-in.	2/2/17

11.0 **Document Author(s):** Avraham Boruchowitz, CSP, CHMM

Appendix A: Hazardous Energy Control Program Flowchart

5. Program Components

Flowchart



Appendix B: Hazardous Energies Control Procedure Form

HAZARDOUS ENERGIES CONTROL PROCEDURE

NOTE: This procedure must be strictly followed to ensure protection of all persons involved.

Equipment ID: Mfgr., Model #, ID #:			
Equipment Location(s):		Date Performed:	
Task To Be Performed:			

Energy Forms: (check and list all that apply)

1. **Electrical**
   - **a. Voltage** - Potential is> 30V RMS or DC but < 600V
     List:_____
   - **b. Voltage** - Potentials are > 600V
     List:_____
   - **c. High Current** - > 25 amperes at any voltage
     List:_____
   - **d. Static Electricity**
2. **Chemical** – Explosion, pressure, extreme heat, fire, corrosive, reactive, oxidizer, toxic
   List:_____
3. **Pressure** - > 1 atm, pneumatic, hydraulic, liquid
   List:_____
4. **Vacuum** - < 1 atm
5. **Mechanical/Kinetic** – capable of crushing, pinching, cutting, snagging, striking
   List:_____
6. **Thermal** - High or Low Temperature - >60°C or < 0°C surface temperature, hot liquids, steam, cryogens
   List:_____
7. **Ionizing Radiation** - > 2mRem/hr
8. **Non-Ionizing Radiation**
   - **a. Ultraviolet** - > ACGIH TLV
   - **b. Infrared** - > ACGIH TLV
   - **c. Rf/Microwave** - > ACGIH TLV
   - **d. Laser** - Class II, Class III, Class IV
   - **e. Magnetic Fields** - > ACGIH TLV
9. **Potential -** Flywheels, springs, differences in elevation, elevated parts that could drop, capacitors, batteries

Note on SHIFT CHANGES: If this procedure lasts more than one work shift, the oncoming persons will apply their locks and tags before the departing shift removes their locks and tags.

Lockout Procedure

Follow the procedure below exactly as listed - check off each line as each step is completed:

1. Notify all Affected and Other Employees of intended lockout.
2. Turn off or shutdown and lockout and tag each energy control point listed below.

Specific Lockout Locations

3. Dissipate any stored energy as described below.

Dissipate These Energy Sources

4. Block any mechanical parts, and remove any mechanical links listed below. Lock blocking in place. (Note: Two physical blocks in the line required with the space in between depressurized and emptied to break and secure any hazardous gas/liquid line.)

Block These Parts/Remove Linkages

5. Verify all persons clear of Hazard Zone.
6. Attempt to re-start machinery or re-energize equipment.
7. Verify no hazardous energy remains by the methods listed below. Use circuit tester/meter if electricity is involved.

Verify No Residual Energy By These Methods

8. Perform required work.

Procedure To Return Equipment To Operation

9. Verify Hazard Zone is clear of equipment, workers, tools, and test equipment.
10. Unlock and remove any blocking devices; replace linkages.
11. Reposition any safety valve(s) left open to prevent re-buildup of pressure.
12. Remove all locks and tags from energy control points.
13. Re-start or re-energize the equipment.
14. Notify all Affected and Other Employees that the lockout has been cleared.

Names of Authorized Lockout/Tagout Employee(s) performing this lockout (only individuals who have completed Lockout/Tagout Training)	

Names of Affected Employees affected by this Lockout procedure (include tool owners, RUPD, Facilities Management, EHS, Affected lab managers)	

Appendix C: Abandoned Lock Removal Authorization Form

Note: Only supervisors can remove abandoned locks.

Name of Person whose lock must be removed: _____

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

Why is it critical to remove this lock now?

_____

_____

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

Supervisor's Name: _____

Signature: _____

Date: _____

EHS Representative: _____

Signature: _____

Date: _____

Director Facilities Management: _____

Signature: _____

Date: _____

Appendix D: Hazardous Energy Control Procedure Review Checklist

Note: This review must be conducted by both Facilities Management and EHS at least annually, and the reviewers must not be participating in the lockout being evaluated. The reviewers should evaluate an actual equipment lockout in progress.

1. Are there written lockout procedures present at the work location for each specific piece of equipment being serviced or maintained?
   ☐ Yes ☐ No

2. Are the "Authorized Lockout/Tagout Employees" certified in writing?
   ☐ Yes ☐ No

3. Are the locks used for lockout uniquely identified, uniquely keyed, and only used for the purpose of lockout?
   ☐ Yes ☐ No

4. Does the tag used with the lock identify the worker who placed the lock?
   ☐ Yes ☐ No

5. Can an "Authorized Lockout/Tagout Employee", when questioned, produce the written procedures?
   ☐ Yes ☐ No

6. Have "Affected and Other Employees" been notified of the lockout? (names entered on procedure)
   ☐ Yes ☐ No

7. Can each "Authorized Lockout/Tagout Employee" working in the hazard zone, when questioned, describe their responsibilities during each part of the lockout process to include verification that all types of stored energy have been identified, identification of the energy control point(s), the reason for the unique lockout hardware, the required steps after the lock is applied (e.g., block, lock blocking in place, dissipate, test or try to restart, warning of "Affected Persons", etc.), and the proper safe steps to restore the equipment to operation?
   (Note: This step may be done as part of a group meeting between the reviewer and each "Authorized Lockout/Tagout Employee" who is or will be participating in the lockout.)
   ☐ Yes ☐ No

Comments:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Name(s) of Authorized Lockout/Tagout Employee(s) Interviewed:

_____
_____

_____

_____

Name of Reviewer: _____ Date of Review: _____

Name of Reviewer: _____ Date of Review: _____